State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

Amanda Smith
Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

FILE COPY

DAQE-AN101420011-14

August 12, 2014

Al Burson
Stericycle Incorporated
28161 North Keith Drive
Lake Forest, IL 60045

Dear Mr. Burson:

Re: Approval Order: Administrative Amendment to Approval Order DAQE-AN101420010-13 for Retrofits to Existing Air Pollution Control Device System
Project Number: N10142-0011

The attached document is the Approval Order for the above-referenced project. Future correspondence on this Approval Order should include the engineer's name as well as the DAQE number as shown on the upper right-hand corner of this letter. The project engineer for this action is Jon Black, who may be reached at (801) 536-4047.

Sincerely,

Bryce C. Bird
Director

BCB:JB:kw

cc: Mike Owens
Davis County Health Department

Document Date 8/12/2014

DAQ-2014-019381

195 North 1950 West • Salt Lake City, UT
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STATE OF UTAH

Department of Environmental Quality

Division of Air Quality

APPROVAL ORDER: Administrative Amendment to Approval Order DAQE-AN101420010-13 for Retrofits to Existing Air Pollution Control Device System

Prepared By: Jon Black, Engineer
Phone: (801) 536-4047
Email: jlblack@utah.gov

APPROVAL ORDER NUMBER

DAQE-AN101420011-14

Date: August 12, 2014

Stericycle Incorporated
BFI Medical Waste Incinerator
Source Contact:
Al Burson
Phone: (847) 370-7995

Bryce C. Bird
Director

Abstract

Stericycle, Inc., (Stericycle) has requested equipment retrofits and replacements to AO DAQE-AN101420010-13 for its hospital, medical, and infectious waste incinerator (HMIWI) facility. The retrofitting activities are to upgrade the air pollution control system. The requested changes will consist of replacement of a gas cooler with a new evaporative cooler, replacement of an electrostatic precipitator with a baghouse, replacement of the wet gas absorber with a new absorber, addition of a carbon bed downstream of the absorber, and include urea or an equivalent reagent for control of NO_x emissions through the existing SNCR system. The existing emergency diesel generator will also be replaced with a new more efficient generator which can handle loss of power at the facility. The emergency diesel generator replacement will minimize bypass events by avoiding the loss of power. Waste delivery, processing, and unloading activities will not change, nor will any other changes be made to the HMIWI.

Stericycle is located in Davis County, which is a nonattainment area of the NAAQS for $PM_{2.5}$ and a maintenance area for Ozone. Davis County is attainment for all other pollutants. NSPS 40 CFR 60 Subparts A, Ce, and IIII regulations apply. MACT 40 CFR 63 Subparts A and ZZZZ regulations apply to this source. Title V of the 1990 Clean Air Act applies to this source. The Title V Operating Permit applies to HMIWI facilities and will be Administratively Amended to incorporate the conditions of this Enhanced AO.

The retrofits at this facility, along with a limitation on the emergency diesel generator hours of operation, will create an emissions reduction in all criteria and HAP emissions. Therefore this permit action will qualify under R307-401-12 (Reduction in Air Contaminants) and will be processed as an Administrative Amendment. Stericycle will remain limited to specific emission concentrations listed in 40 CFR 60 Subpart Ce, R307-222 and R307-201-3. The emission reductions from the retrofits, in tons per year, are as follows: Particulate Matter (-0.63), PM_{10} (-0.63), $PM_{2.5}$ (-0.63), NO_x (-1.60), SO_2 (-6.73), CO (-2.01), VOC (-0.13), HAPs (-7.76) and CO_2e (-26.75).

The controlled PTE emissions, in TPY, will be as follows beginning October 6, 2014: Particulate Matter = 1.38, PM_{10} = 1.38, $PM_{2.5}$ (Subset of PM_{10}) = 1.38, NO_x = 14.97, SO_2 = 1.33, CO = 0.96, VOC = 0.24, Total HAPs = 1.66 and CO_2e = 10,930.13.

This air quality AO authorizes the project with the following conditions and failure to comply with any of the conditions may constitute a violation of this order. This AO is issued to, and applies to the following:

Name of Permittee:

Stericycle Incorporated
28161 North Keith Drive
Lake Forest, IL 60045

Permitted Location:

BFI Medical Waste Incinerator
90 North 1100 West
North Salt Lake, UT 84054

UTM coordinates: 420687 m Easting, 4521849 m Northing, UTM Zone 12
SIC code: 4953 (Refuse Systems)

Section I: GENERAL PROVISIONS

I.1 All definitions, terms, abbreviations, and references used in this AO conform to those used in the UAC R307 and 40 CFR. Unless noted otherwise, references cited in these AO conditions refer to those rules. [R307-101]

I.2 The limits set forth in this AO shall not be exceeded without prior approval. [R307-401]

I.3 Modifications to the equipment or processes approved by this AO that could affect the emissions covered by this AO must be reviewed and approved. [R307-401-1]

I.4 All records referenced in this AO or in other applicable rules, which are required to be kept by the owner/operator, shall be made available to the Director or Director's representative upon request, and the records shall include the two-year period prior to the date of the request. Unless otherwise specified in this AO or in other applicable state and federal rules, records shall be kept for a minimum of five (5) years. [R307-401-8]

I.5 At all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any equipment approved under this Approval Order including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Director which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source. All maintenance performed on equipment authorized by this AO shall be recorded. [R307-401-4]

I.6 The owner/operator shall comply with UAC R307-107. General Requirements: Breakdowns. [R307-107]

I.7 The owner/operator shall comply with UAC, R307-150 Series. Inventories, Testing and Monitoring. In addition to the requirements of UAC, R307-150 the owner/operator shall comply with more frequent inventory submittals as required by the Utah State Plan for Hospital, Medical, Infectious Waste Incinerators as required under R307-220-3 and R307-222. [R307-150, R307-220-3, R307-222]

Section II: SPECIAL PROVISIONS

II.A The approved installations shall consist of the following equipment:

II.A.1 **Hospital, Medical, Infectious Waste Incinerator**
Site Wide

II.A.2 **Incinerator (designated as HMIWI)**
One (1) incinerator

Manufacturer:	Joy Energy System, Inc
Maximum Design Feed Rate:	2,500 lbs of waste charged per hour
Model:	TES2500

Equipped with natural gas-fired auxiliary burners, a bypass stack, automated waste feed system and ash removal system.

II.A.3 **Incinerator Emissions Control System**
HMIWI emission control system includes:

One (1) evaporative gas cooler*
One (1) carbon, sodium bicarbonate, lime, and/or equivalent injection system*
One (1) baghouse*
One (1) wet gas absorber*
One (1) scrubbing system
One (1) carbon bed*
One (1) selective non-catalytic reduction (SNCR) system (New equipment added in 2012)
* Retrofits to commence in 2014

Note: The injection system will remove and control dioxin/furan and mercury. The SNCR system controls NO_x emissions.

II.A.4 **Waste Heat Boiler**
One (1) natural gas-fired boiler

Manufacturer:	Superior Boiler
Model No.	Apache 11S8-WH-2904
Maximum Capacity:	11,078 lbs/hr of 200 psi steam or equivalent.

II.A.5 **Sodium Bicarbonate, Lime, or Equivalent Silo**
One (1) sodium bicarbonate, lime or equivalent silo equipped with a fabric filter.

II.A.6 **Emergency Generator**
One (1) Emergency Generator
Fuel Type: Diesel
Maximum Generator Rating: 762 hp

II.A.7 **Support Facilities**
On-site support equipment consisting of refrigerated storage facilities for medical waste are noted as being located on the property but do not emit air contaminants.

II.B Requirements and Limitations

II.B.1 **The Hospital, Medical, and Infectious Waste incinerator (HMIWI) Facility Requirements:**

II.B.1.a The owner/operator shall notify the Director in writing when the installation of the new retrofit equipment listed in Conditions II.A.3 and II.A.6 have been completed and are operational. To ensure proper credit when notifying the Director, send your correspondence to the Director, attn: Compliance Section.

If installation has not been completed within 18 months from the date of this AO, the Director shall be notified in writing on the status of the construction and/or installation. At that time, the Director shall require documentation of the continuous installation of the operation and may revoke the AO. [R307-401-18]

II.B.1.b The owner/operator shall operate its HMIWI in accordance with 40 CFR 60 Subpart Ce (Emission Guidelines and Compliance Times for Hospital/Medical/Infectious Waste Incinerators), Utah Rule R307-222 (Emission Standards: Existing Incinerators for Hospital, Medical, Infectious Waste) and the Utah State Plan for Hospital, Medical, Infectious Waste Incinerators as required under R307-220-3 (Section II, Hospital, Medical, Infectious Waste Incinerators). [40 CFR 60 Subpart Ce, R307-220-3, R307-222]

II.B.1.c The owner/operator shall operate the HMIWI below the maximum charge rate on a 3-hour rolling average basis. The maximum charge rate is defined as 110 percent of the lowest 3-hour average charge rate measured during the most recent performance test demonstrating compliance with all applicable emission limits. Records of the waste feed rate shall be kept at all times of incinerator operation and made available to the Director upon request. [40 CFR 60 Subpart Ce, R307-222, R307-401-8]

II.B.1.d Prior to October 6, 2014, emissions to the atmosphere from the indicated emission point shall not exceed the following rates and concentrations:

Source: Incinerator Emission Control System Exhaust Stack

Pollutant	Units (7% Oxygen, dry basis)	Limit
Particulate Matter	Milligrams per dry standard cubic meter (mg/dscm) Grains per dry standard cubic foot (gr/dscf)	34 0.015
Carbon Monoxide	Parts per million by volume (ppmv)	40
Dioxin/Furans	Nanograms per dry standard cubic meter total dioxin/furans (ng/dscm) Grains per billion dry standard cubic feet (gr/10^9 dscf) or; ng/dscm TEQ gr/10^9dscf TEQ	125 55 2.3 1.0
Hydrogen Chloride	ppmv or percent reduction	100 or 93%
Sulfur Dioxide	ppmv	55
Nitrogen Oxides	ppmv	250
Lead	mg/dscm grains per thousand dry standard cubic feet (gr/10^3 dscf) percent reduction	1.2 0.52 70%
Cadmium	mg/dscm gr/10^3dscf or percent reduction	0.16 0.07 65%
Mercury	mg/dscm gr/10^3dscf or percent reduction	0.55 0.24 85%

[40 CFR 60 Subpart Ce]

II.B.1.e Beginning October 6, 2014, emissions to the atmosphere from the indicated emission point shall not exceed the following rates and concentrations:

Source: Incinerator Emission Control System Exhaust Stack

Pollutant	Units (7% Oxygen, dry basis)	Limit
Particulate Matter	Milligrams per dry standard cubic meter(mg/dscm) Grains per dry standard cubic foot (gr/dscf)	25 0.011
Carbon Monoxide	Parts per million by volume (ppmv)	11

Dioxin/Furans	Nanograms per dry standard cubic meter total dioxin/furans (ng/dscm)	9.3
	Grains per billion dry standard cubic feet (gr/10^9 dscf)	4.1
	or;	
	ng/dscm TEQ	0.054
	gr/10^9dscf TEQ	0.024
Hydrogen Chloride	ppmv	6.6
Sulfur Dioxide	ppmv	9.0
Nitrogen Oxides	ppmv	140
Lead	mg/dscm	0.036
	grains per thousand dry standard cubic feet (gr/10^3 dscf)	0.016
Cadmium	mg/dscm	0.0092
	gr/10^3dscf	0.0040
Mercury	mg/dscm	0.018
	gr/10^3dscf	0.0079

[40 CFR 60 Subpart Ce]

II.B.1.f An initial stack test to show compliance with the emission limitations stated in Condition II.B.1.e.shall be performed for PM, CO, HCl, Dioxin/Furan, SO_2, NO_x, Pb, Cd, and Hg. The stack test shall be performed within 180 days of the installation of the Incinerator Emission Control System as designated in Condition II.A.3 of this AO or by October 6, 2014, whichever is later. Subsequent stack testing shall be performed for PM, CO, and HCl once per calendar year in accordance with 40 CFR 60 Subpart Ce, R307-222 and the Utah State HWIMI Plan. The annual testing frequency can be reduced to once every three years if all three performance tests over a 3-year period indicate compliance with the emission limits for each of the three pollutants. The frequency shall return to annual testing for a particular pollutant if a performance test for that pollutant indicates noncompliance with the respective emission limit. Upon operation of NO_x and CO CEMS as described in Condition II.B.1.g, stack testing for NO_x and CO will not be required. The use of the bypass stack during a stack test shall invalidate the stack test. [40 CFR 60 Subpart Ce, R307-222]

II.B.1.f.1 Each stack test shall consist of a minimum of three test runs conducted under representative operating conditions. When testing is required, Dioxin/Furan, Pb, Cd, and Hg shall be tested simultaneously, and the minimum sample time shall be 4 hours per test run unless otherwise indicated. When testing is required, PM, CO, HCl, SO_2, and NOX shall be tested simultaneously, and the minimum sample time shall be 1 hour per test run unless otherwise indicated. All stack testing data and results shall be submitted to the Director within 60 days of the testing date(s). [R307-165, R307-401-8]

II.B.1.f.2 Notification

The Director shall be notified at least 30 days prior to conducting any required emission testing. A source test protocol shall be submitted to DAQ when the testing notification is submitted to the Director.

The source test protocol shall be approved by the Director prior to performing the test(s). The source test protocol shall outline the proposed test methodologies, stack to be tested, and procedures to be used. A pretest conference shall be held, if directed by the Director. [R307-165]

II.B.1.f.3 Existing Source Operation: For an existing source/emission point, the production rate during all compliance testing shall be no less than 90% of the maximum production achieved in the previous three (3) years. [R307-165]

II.B.1.f.4 Sample Location

The emission point shall be designed to conform to the requirements of 40 CFR 60, Appendix A, Method 1, or other EPA-approved testing method, as acceptable to the Director. An Occupational Safety and Health Administration (OSHA) or Mine Safety and Health Administration (MSHA) approved access shall be provided to the test location. [R307-165]

II.B.1.f.5 Volumetric Flow Rate

40 CFR 60, Appendix A, Method 2. [R307-165]

II.B.1.f.6 Particulate Matter

40 CFR 60, Method 5 of Appendix A-3, 26A or 29 of Appendix A-8 or other EPA approved method as acceptable to the Director. [R307-165]

II.B.1.f.7 Carbon Monoxide

40 CFR 60, Method 10 or 10B of Appendix A-4 or other EPA approved method as acceptable to the Director. [R307-165]

II.B.1.f.8 Dioxins/furans

40 CFR 60, Method 23 of Appendix A-7 or other EPA approved method as acceptable to the Director. [R307-165]

II.B.1.f.9 Hydrogen Chloride

40 CFR 60, Method 26 or 26A of Appendix A-8 or other EPA approved method as acceptable to the Director. [R307-165]

II.B.1.f.10 Sulfur Dioxide

40 CFR 60, Method 6 or 6C of Appendix A-4 or other EPA approved method as acceptable to the Director. [R307-165]

II.B.1.f.11 Nitrogen Oxides

40 CFR 60, Method 7 or 7E of Appendix A-4 or other EPA approved method as acceptable to the Director. [R307-165]

II.B.1.f.12 Lead, Cadmium and Mercury

40 CFR 60, Method 29 of Appendix A-8 or other EPA approved method as acceptable to the Director. [R307-165]

II.B.1.g The owner/operator shall operate continuous emissions monitoring systems (CEMS) or other alternative monitoring approach approved by the Director to demonstrate compliance with NO_x and CO emissions limits. An O_2 monitor shall also be installed for adjusting the readings to percent O_2. Compliance with the NO_x and CO emission limits shall be demonstrated using a 12-hour rolling average, calculated each hour as the average of the previous 12 operating hours and not including startup, shutdown, or malfunction. While the affected emission unit is operating, hourly NO_x and CO emission rates expressed in ppmv shall be determined in accordance with R307-170 using the appropriate conversion factors. The CEMS shall be installed and operating no later than 18 months from the issuance date of this AO, unless an approved alternative is implemented. Prior to the installation and operation of the NO_x and CO CEMS, compliance with the NO_x and CO emissions limits shall be demonstrated by maintaining the minimum and maximum operating parameters identified in Conditions II.B.1.h and II.B.1.i.1 in accordance with 40 CFR 62 Subpart HHH and R307-222. CEMS shall be installed, calibrated, operated, and maintained in accordance with R307-170. [R307-170, R307-222]

II.B.1.h Prior to the installation and operation of the CO CEMS, as described in Condition II.B.1.g, operating above the maximum charge rate (3-hour rolling average) and below the minimum secondary chamber temperature (3-hour rolling average) simultaneously constitutes a violation of the CO emissions limit. [R307-222]

II.B.1.i The SNCR system shall inject ammonia, urea or an equivalent reagent into the incinerator's secondary chamber exhaust stream prior to the exhaust gas being fed into the waste heat boiler. All equivalent reagents shall be approved by the Director. [R307-401-8]

II.B.1.i.1 The owner/operator shall establish the minimum reagent flow rate based on performance testing. The minimum reagent flow rate means 90 percent of the highest 3-hour average injection rate (taken, at a minimum, once every minute) measured during the most recent performance test demonstrating compliance with the NO_x emission limit. Prior to the installation and operation of the NO_x CEMS, as described in Condition II.B.1.g, operating above the maximum charge rate (3-hour rolling average), below the minimum secondary chamber temperature (3-hour rolling average), and below the minimum reagent flow rate (3-hour rolling average) simultaneously constitutes a violation of the NO_x emissions limit. [R307-222, R307-401-8]

II.B.1.i.2 The owner/operator shall record the amount and type of NO_x reagent used during each hour of operation. [R307-401-8]

II.B.1.j The baghouse shall operate in accordance with the following:

A) The pressure drop of the baghouse shall not be less than one (1) inches of water column or more than ten (10) inches of water column.

B) The baghouse operating parameters shall be monitored with equipment located such that an inspector/operator can safely read the output any time. The pressure drop readings shall be accurate to within plus or minus 0.5 inches of water column.

C) All instruments shall be calibrated according to the manufacturer's instructions.

[R307-401-8]

II.B.1.k The owner/operator shall not allow visible emissions to exceed the following:

A) All baghouse emission points - 10% opacity

B) Sodium bicarbonate, lime, or equivalent silo emission point - 10% opacity

C) All diesel generator emission points - 20% opacity

D) All other stationary point or fugitive emission sources on site - 20% opacity*

* The 20% opacity limitation does not apply to the by-pass stack during by-pass events.

[R307-201-3]

II.B.1.k.1 A visual observation of the sodium bicarbonate, lime, or equivalent silo shall be performed once during each filling operation by an individual trained on the observation procedures of 40 CFR 60, Appendix A, Method 9. The individual is not required to be a certified visible emissions observer (VEO). If any visible emissions are observed, filling operations shall be suspended and the dust control device as well as any associated ducting shall be inspected. Any conditions existing outside of normal operational parameters shall be corrected and filling activities may resume. Upon resumption of filling operations a 40 CFR 60, Appendix A, Method 9 opacity determination of the silo shall be performed by a certified observer.

All other opacity observations of emissions from stationary sources shall be conducted according to 40 CFR 60, Appendix A,Method 9.

For sources that are subject to NSPS, opacity shall be determined by conducting observations in accordance with 40 CFR 60.11(b) and 40 CFR 60, Appendix A,Method 9. [R307-203-1]

II.B.1.k.2 Records of visual emission observations shall be kept at all times of filling operations. The records shall include the date, time and visual observation value noted. All records shall be kept in accordance with Condition I.4 of this AO. [R307-401-8]

II.B.2 **Emergency Diesel Generator Requirements**

II.B.2.a The emergency diesel generator shall not exceed 122 hours of operation per rolling 12-month period. [R307-401-8]

II.B.2.a.1 To determine compliance with a rolling 12-month total, the owner/operator shall calculate a new 12-month total for each day of the previous month by the twentieth day of each month using data from the previous 12 months. Hours of operation shall be determined by supervisor monitoring and maintaining of an operations log for the generator.

[R307-401-8]

II.B.2.b The sulfur content of any diesel fuel burned in any diesel engine on-site shall not exceed 15 ppm. [R307-401-8]

II.B.2.b.1 The sulfur content shall be determined by ASTM Method D2880-71, D4294-89, or approved equivalent. Certification of diesel fuel shall be either by the owner/operator's own testing or by test reports from the diesel fuel marketer. [R307-203-1]

Section III: APPLICABLE FEDERAL REQUIREMENTS

In addition to the requirements of this AO, all applicable provisions of the following federal programs have been found to apply to this installation. This AO in no way releases the owner or operator from any liability for compliance with all other applicable federal, state, and local regulations including UAC R307.

NSPS (Part 60), A: General Provisions
NSPS (Part 60), Ce: Emission Guidelines and Compliance Times for Hospital/Medical/Infectious Waste Incinerators
NSPS (Part 60), IIII: Standards of Performance for Stationary Compression Ignition Internal Combustion Engines
MACT (Part 63), A: General Provisions
MACT (Part 63), ZZZZ: National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines
Title V (Part 70) area source

PERMIT HISTORY

This AO is based on the following documents:

Is Derived From	Notice of Intent dated March 7, 2014
Replaces	AO DAQE-AN101420010-13 dated January 8, 2013
Incorporates	Additional NOI Information dated March 24, 2014
Incorporates	Additional Source Information dated April 3, 2014
Incorporates	Additional Source Information dated June 20, 2014

ADMINISTRATIVE CODING

The following information is for UDAQ internal classification use only:

Davis County
CDS B
MACT (Part 63), Nonattainment or Maintenance Area, Title V (Part 70) major source, NSPS (Part 60),

ACRONYMS

The following lists commonly used acronyms and associated translations as they apply to this document:

40 CFR	Title 40 of the Code of Federal Regulations
AO	Approval Order
BACT	Best Available Control Technology
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CDS	Classification Data System (used by EPA to classify sources by size/type)
CEM	Continuous emissions monitor
CEMS	Continuous emissions monitoring system
CFR	Code of Federal Regulations
CMS	Continuous monitoring system
CO	Carbon monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent - 40 CFR Part 98, Subpart A, Table A-1
COM	Continuous opacity monitor
DAQ	Division of Air Quality (typically interchangeable with UDAQ)
DAQE	This is a document tracking code for internal UDAQ use
EPA	Environmental Protection Agency
FDCP	Fugitive dust control plan
GHG	Greenhouse Gas(es) - 40 CFR 52.21 (b)(49)(i)
GWP	Global Warming Potential - 40 CFR Part 86.1818-12(a)
HAP or HAPs	Hazardous air pollutant(s)
ITA	Intent to Approve
LB/HR	Pounds per hour
MACT	Maximum Achievable Control Technology
MMBTU	Million British Thermal Units
NAA	Nonattainment Area
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standards for Hazardous Air Pollutants
NOI	Notice of Intent
NO_x	Oxides of nitrogen
NSPS	New Source Performance Standard
NSR	New Source Review
PM_{10}	Particulate matter less than 10 microns in size
$PM_{2.5}$	Particulate matter less than 2.5 microns in size
PSD	Prevention of Significant Deterioration
PTE	Potential to Emit
R307	Rules Series 307
R307-401	Rules Series 307 - Section 401
SO_2	Sulfur dioxide
Title IV	Title IV of the Clean Air Act
Title V	Title V of the Clean Air Act
TPY	Tons per year
UAC	Utah Administrative Code
UDAQ	Utah Division of Air Quality (typically interchangeable with DAQ)
VOC	Volatile organic compounds

NEW SOURCE REVIEW SECTION

SITE ID # AND PROJECT #: N101420011-14
COMPANY NAME: Stericycle Incorporated: BFI Medical Waste Incinerator
REGARDING: Administrative Amendment to AO DAQE-AN101420010-13 for Retrofits to Existing Air Pollution Control Device System

THE ATTACHED DOCUMENT IS CATEGORIZED AS: (PLEASE CHOOSE ONE)

	NEWSPAPER NOTICE (NN)	Office Tech signs cover letter of Newspaper Notice
	INTENT TO APPROVE (ITA)	Cover letter and ITA signed by associated Section Manager Electronic Copy of ITA sent to Ron Reece
✓	APPROVAL ORDER (AO)	Copy of purple sheet and cover letter of AO to Teri Weiss
	EXPERIMENTAL AO	Copy of purple sheet and cover letter of AO to Teri Weiss
	CORRESPONDENCE	Signatory varies
	SOIL REMEDIATION	If associated fee, send copy of purple sheet and letter to Teri Weiss
	SALES TAX EXEMPTION (TAX)	
	SMALL SOURCE EXEMPTION	Copy of purple sheet and letter to Teri Weiss
	EMISSIONS BANKING LETTER	Copy of letter to Camron Harry
	NAME CHANGE	Copy of purple sheet and letter to Teri Weiss

3X

COPIES TO BE SENT TO THE FOLLOWING PARTIES: (PLEASE CHECK AS THEY APPLY)

✓	Manila File Folder (working file)	✓	Greens Folder
✓	Health Department (see letter for which) **Davis County Health Department**	✓	EPA – Mike Owens
✓	Compliance (associated Section Manager) **Jay Morris**		Finance – Teri Weiss
	Name Change Letters: Deborah McMurtrie Susan Weisenberg Dave Beatty		Brett Wilding, Utah State Tax Commission, Technical Research Unit
	Offsets Used? Copy of document(s) to Camron Harry		Enter final Name Change Letters in /engineer/aoname
	Copy To:		Enter in /engineer/aocond & in AO Log: (AOs, AO not needed, Replacement in Kind)
	NEWSPAPER NOTICE – COPIES TO: Cities, Counties, Gov. Agencies, & etc./& a copy of Public Official letter with self-addressed envelope E-Mail To: dvd.kvd@juno.com, Jodie Swanson, Lori Walker, Debbie Oberndorfer, Bill Sinclair, Beverly Rasmussen & Jen Burge, Donna Spangler, Ron Reece, and Kelly Beck E-Mail copy & Fax to Newspaper Agencies		PSD PROJECTS: Copy the NOI, Engineering Review, ITA, NOTICE & AO Send to: Mike Owens, EPA Don Banks, Bureau of Land Management Chris Hocket, U.S. Forest Service Chris Shaver, National Park Service TITLE V: Check w/ NSR Engineer for which document(s) to be copied.

REVIEWED BY AND DOCUMENT SIGN OFF DATES:

Completeness determination	March 24, 2014	**Jon Black**
Peer review of project	March 28, 2014	Tad Anderson
Section Manager sign off	7/23/14 MG	Martin Gray
Branch Manager sign off		Reginald Olsen

Stericycle®
Protecting People. Reducing Risk.™

March 7, 2014

Mr. Bryce Bird, Director
Attn.: Jon Black, Engineer
State of Utah, Division of Air Quality
150 North 1950 West
PO Box 144820
Salt Lake City, UT 84114-4820

RE: Notification of Reduction in Air Contaminants, R307-401-12

Dear Mr. Bird:
The purpose of this letter is to provide notification of a project that Stericycle, Inc. (Stericycle) proposes to complete pursuant to R307-401-12, Reduction in Air Contaminants. On January 8, 2014, Steven McOmber, Stericycle, met with Jon Black, UDAQ, to discuss a project to upgrade air pollution controls and to install a newer, more efficient backup generator. Mr. Black suggested that Stericycle evaluate the impact of the project on emissions in order to determine if the project would qualify as a Reduction in Air Contaminants project pursuant to R307-401-12. As detailed in this letter and attachments, we have concluded that the project does satisfy the requirements of R307-401-12 and this notice is being provided pursuant to that requirement. We request your concurrence.

Project Overview

Stericycle owns and operates a hospital, medical, and infectious waste incinerator (HMIWI) facility in North Salt Lake, Utah (NSL facility). The NSL facility operates pursuant to Approval Order No. DAQE-AN101420010-13 and Title V Operating Permit Source I.D. No. 1100055002. Stericycle's HMIWI is subject to Utah's HMIWI regulation (R307-222) and the U.S. Environmental Protection Agency's (U.S. EPA's) HMIWI Emission Guidelines at 40 CFR Part 60, Subpart Ce.

U.S. EPA promulgated amendments to 40 CFR Part 60, Subpart Ce on October 6, 2009 that, among other requirements, contain more stringent emission limitations for particulate matter (PM), carbon monoxide (CO), dioxins/furans (CDD/CDF), hydrogen chloride (HCl), sulfur dioxide (SO_2), nitrogen oxides (NOx), lead (Pb), cadmium (Cd), and mercury (Hg). Similarly, Utah adopted amendments to R307-222 and its State Plan on March 7, 2012 intended to be no less stringent than the amended Federal rule. Compliance with the amended Federal rule is implemented through the Utah State Plan and 40 CFR Part 62, Subpart HHH (Federal Plan), and is required no later than October 6, 2014.

Stericycle has determined that certain retrofits to the existing air pollution control system at the NSL facility will be required in order to achieve compliance with the more stringent emission limitations. (Stericycle has previously received approval to install and operate a selective noncatalytic reduction (SNCR) system for controlling NOx emissions.) As discussed below these

retrofits will result in the reduction in emissions of several air contaminants and will not increase the potential to emit of any air contaminant or cause emissions of any new air contaminant.

Stericycle is also proposing to replace its existing 268 hp emergency generator with a maximum 762 hp (350 ekW) emergency generator. The replacement is expected to minimize bypass events that might otherwise occur due to loss of power. Although the replacement generator is larger, it is newer and more efficient. Stericycle has based the potential to emit for the emergency generator on 122 hours of operation per year. The overall effect of the project will be a reduction in the emissions of all air contaminants.

Process Description

This section addresses the current configuration and proposed future configuration following the implementation of the proposed air pollution control device retrofit activities.

Current Process Description

Stericycle operates a Joy Energy Systems, Inc. incinerator, model 2500-TES. The incinerator is a two stage combustion system. The HMIWI is equipped with an automated waste feed system and an ash removal system. Material is fed into the primary stage via a dual door ram feed system. Residence time of the waste in the primary chamber is approximately 4-8 hours at a temperature greater than 1,500°F. The secondary chamber is designed with an extended residence time in an excess air environment allowing complete oxidation and combustion of the primary chamber exhaust gas. Residence time of the gas in the secondary chamber is at least two seconds at or above 1,800°F. Chamber temperatures are monitored and recorded. The primary chamber is equipped with two natural gas-fired burners and the secondary chamber is equipped with one natural gas-fired burner. The natural gas-fired burners are utilized, when necessary, to maintain the combustion temperature.

Exhaust gas from the secondary chamber of the incinerator is injected with reagent for control of NO_X emissions (i.e., SNCR) prior to being fed into a waste heat boiler. The flue gas from the boiler enters the gas cooler and, upon its exit, carbon and sodium bicarbonate are added. The injection of carbon helps to control dioxin/furans and mercury emissions from the flue gas. The addition of sodium bicarbonate neutralizes the flue gas before it enters the electrostatic precipitator (ESP). After the ESP, the flue gas enters the wet gas absorber, where it is in direct contact with a neutralizing agent injection system. The neutralizing agent injection system balances the flue gas pH, prior to venting to the atmosphere via a single stack. A process flow diagram of the HMIWI and current air pollution control device configuration is presented in Figure A-1.

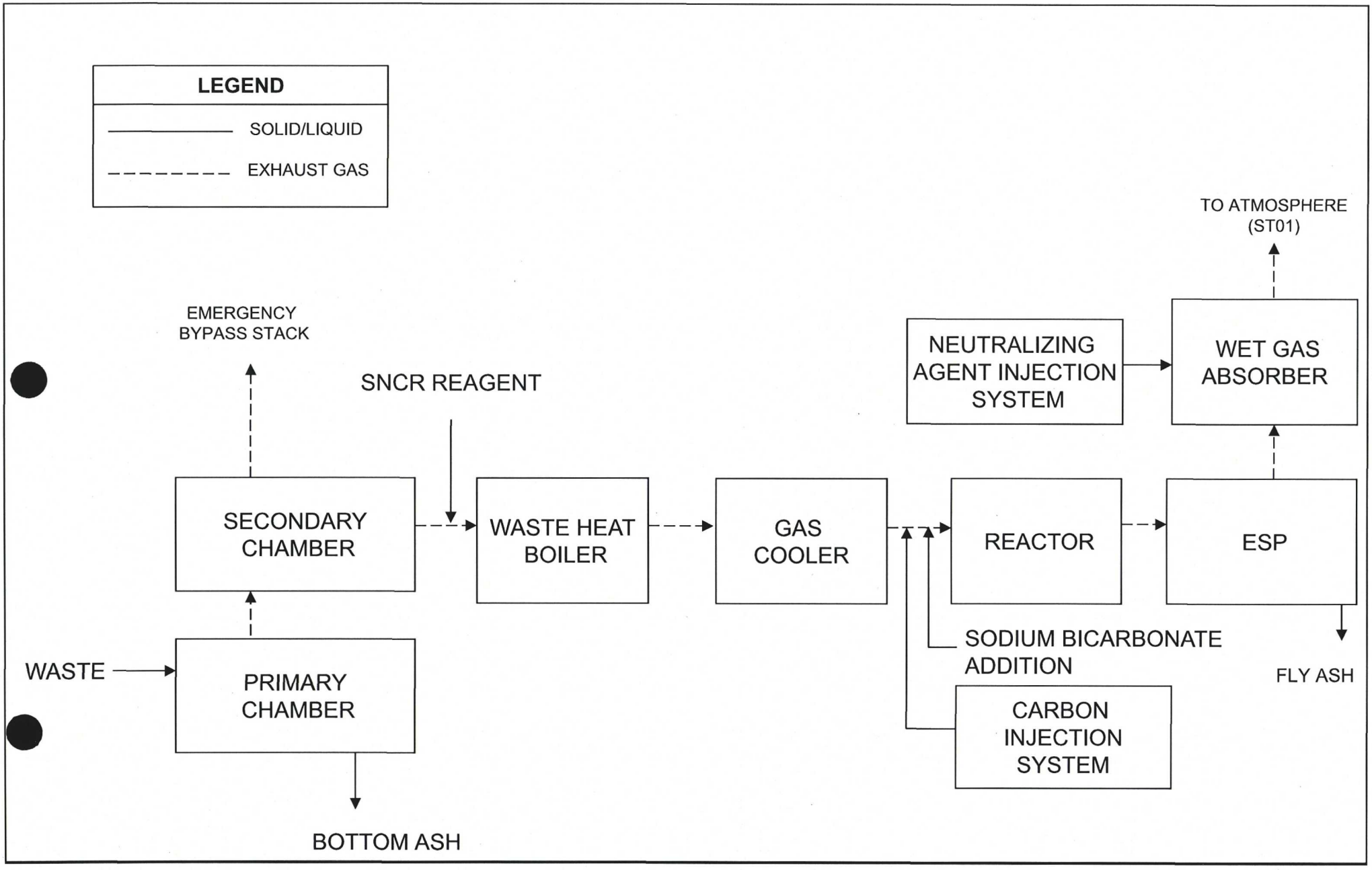

Figure A-1
Current Configuration
North Salt Lake, Utah - Process Flow Diagram
Stericycle, Inc

Future Process Description

Stericycle is proposing to perform the following retrofit activities to the existing air pollution control device systems:

- Replace the gas cooler with a new evaporative cooler.
- Inject sodium bicarbonate, lime, or equivalent as demonstrated through performance testing.
- Replace the ESP with a baghouse.
- Replace the wet gas absorber with a new absorber.
- Add a carbon bed downstream of the condenser.
- Include the use of ammonia, urea, or an equivalent reagent in order to control NO_X emissions through the existing SNCR system.

Stericycle is also proposing to replace its existing 268 hp emergency generator with a maximum 350 ekW (762 hp) emergency generator. Waste delivery, processing, and unloading activities will not change, nor will any other changes be made to the HMIWI. A process flow diagram of the HMIWI with the proposed air pollution control device system retrofits is presented in Figure A-2.

Documented Reduction of Air Contaminants

The attached tables demonstrate that the proposed project will result in a decrease or no change in emissions of all air contaminants. The following tables are presented:

- Table 1 – Summary of Incinerator Potential Emissions (Current Scenario)
- Table 2 – Summary of Incinerator Potential Emissions (Following Additional Retrofits and Implementation of New R307-222 Emission Standards)
- Table 3 – Existing Emergency Generator Potential Emissions
- Table 4 – New Emergency Generator Potential Emissions
- Table 5 – Summary of Emission Reductions

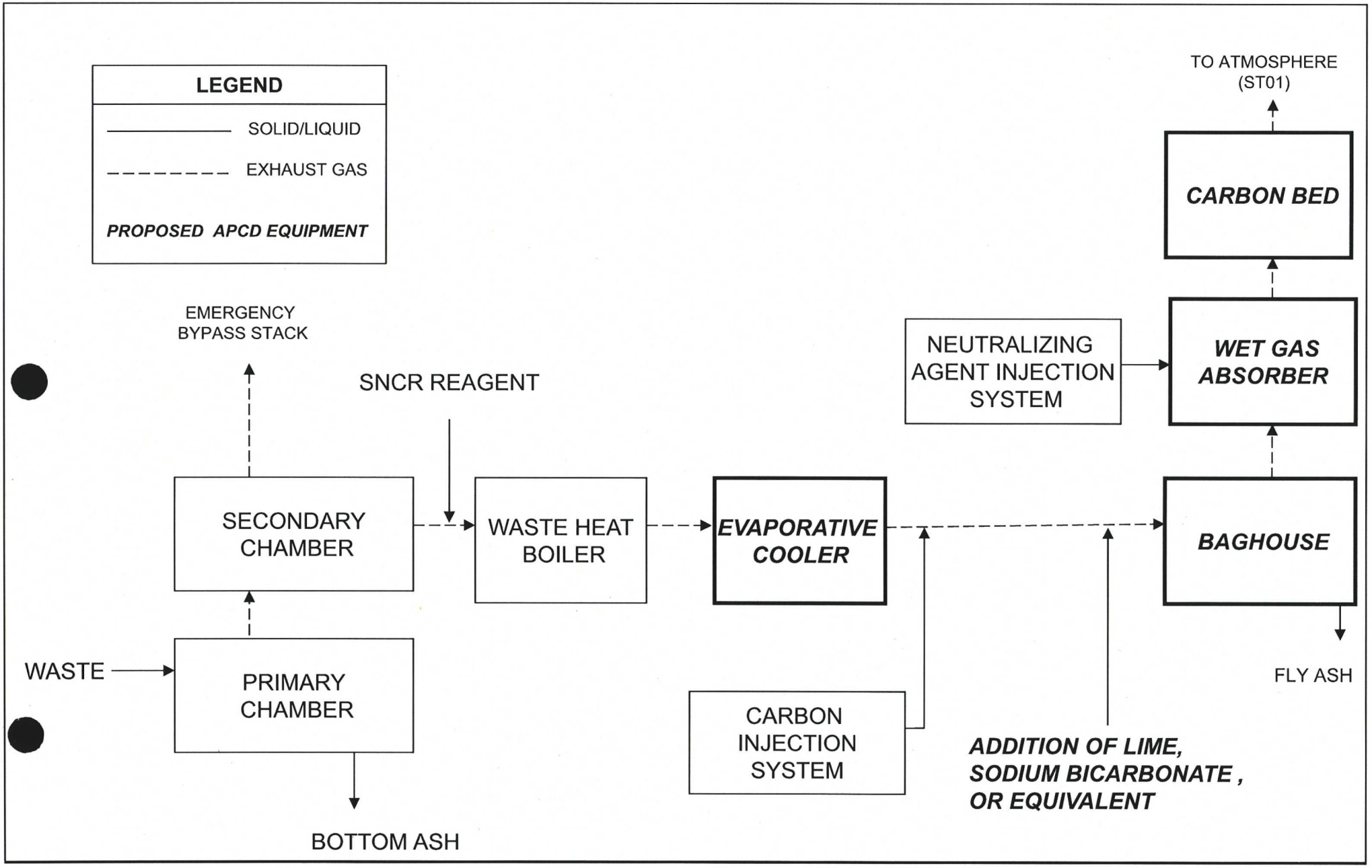

Figure A-2
Proposed Configuration
North Salt Lake, Utah - Process Flow Diagram
Stericycle, Inc

Regulatory Analysis

R307-401-12 provides that the owner or operator of a stationary source of air contaminants that reduces or eliminates air contaminants is exempt from approval order requirements if the project does not increase the potential to emit of any air contaminant or cause emissions of any new air contaminant and the Director is notified of the change so that the reduction may be made enforceable in the approval order. As demonstrated above, this project will result in a reduction in air contaminants and does not increase the annual potential to emit of any air contaminant or cause emissions of any new air contaminant. R307-401-12 allows for notification to be provided "no later than 60 days after the changes are made." Stericycle is providing this notice in advance of the project and requests UDAQ concurrence that the project as described in this notification qualifies for the exemption provided by R307-401-12.

Title V

Stericycle will address any revisions that are necessary to the facility's Title V permit in accordance with R307-415.

Stericycle appreciates your assistance in this matter. If you should have any questions regarding this request, please contact our Environmental Manager, Steven McOmber.

Respectfully,

Dale Rich
Regional Operations Director
Stericycle, Inc.

4825-4774-2489.1

Table 1

Stericycle, Inc. - North Salt Lake, UT Facility

Summary of Incinerator Potential Emissions (Current Scenario)

Pollutant	Emission Factor [a]	Units	Emission Factor Source [b]	Throughput	Units	Potential Emissions	
						lb/hr	tons/yr
PM/PM_{10}	0.015	gr/dscf @ 7% O_2	R307-222-3(1)	197,966	dscf/hr @ 7% O_2	0.42	1.86
CO	40	ppmv @ 7% O_2	R307-222-3(1)	3,299	dscf/min @7% O_2	0.58	2.52
SO_2	55	ppmv @ 7% O_2	R307-222-3(1)	3,299	dscf/min @7% O_2	1.81	7.93
NO_x	250	ppmv @ 7% O_2	R307-222-3(1)	3,299	dscf/min @7% O_2	5.91	25.88
VOC	4.71E-02	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	4.67E-02	0.20
Hydrogen Chloride	100	ppmv @ 7% O_2	R307-222-3(1)	3,299	dscf/min @7% O_2	1.87	8.21
Dioxins/Furans	55	gr/10^9 dscf @ 7% O_2	R307-222-3(1)	197,966	dscf/hr @ 7% O_2	1.56E-06	6.81E-06
Lead	0.52	gr/10^3 dscf @ 7% O_2	R307-222-3(1)	197,966	dscf/hr @ 7% O_2	1.47E-02	6.44E-02
Cadmium	0.07	gr/10^3 dscf @ 7% O_2	R307-222-3(1)	197,966	dscf/hr @ 7% O_2	1.98E-03	8.67E-03
Chlorine	1.05E-01	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	1.04E-01	4.56E-01
Mercury	0.24	gr/10^3 dscf @ 7% O_2	R307-222-3(1)	197,966	dscf/hr @ 7% O_2	6.79E-03	2.97E-02
Aluminum	3.03E-03	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	3.01E-03	1.32E-02
Antimony	2.10E-04	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	2.08E-04	9.12E-04
Arsenic	1.19E-05	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	1.18E-05	5.17E-05
Barium	7.39E-05	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	7.33E-05	3.21E-04
Beryllium	6.25E-06	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	6.20E-06	2.72E-05
Chromium	3.06E-04	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	3.04E-04	1.33E-03
Copper	1.25E-03	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	1.24E-03	5.43E-03
Hydrogen Bromide	4.33E-02	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	4.30E-02	1.88E-01
Hydrogen Fluoride	1.49E-01	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	1.48E-01	6.47E-01
Iron	1.44E-02	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	1.43E-02	6.26E-02
Manganese	5.67E-04	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	5.62E-04	2.46E-03
Nickel	4.54E-04	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	4.50E-04	1.97E-03
Silver	6.65E-05	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	6.60E-05	2.89E-04
SO_3	9.07E-03	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	9.00E-03	3.94E-02
Thallium	1.10E-03	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	1.09E-03	4.78E-03
Total PCBs	4.65E-05	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	4.61E-05	2.02E-04
Ammonia	1.00	ppm	Engineering Estimate	3,299	dscf/min @7% O2	8.75E-03	3.83E-02
CO_2e	-	-	-	-	-	2,484.04	10,880.09
CO_2	147.23	lb/MMBtu	*2012 stack test*	*16.86*	*MMBtu/hr*	2,482.87	10,874.97
CH_4	0.05	lb/ton	*AP-42 Chapter 2.3*	*1,984*	*lbs waste/hr*	4.67E-02	2.05E-01
Total HAPs	-	-	-	-	-	2.15	9.42

[a] Stericycle received approval to add SNCR to aid in NO_X control via Approval Order No. DAQE-AN101420010-13 issued on January 8, 2013, but will remain subject to the NO_X emission limit of 250 ppmv @ 7% O_2 until the amended 40 CFR Part 60, Subpart Ce and R307-222 NO_X emission limit of 140 ppmv @ 7% O_2 becomes applicable.

[b] Emission factors from UAC Rule R307-222-3(1) - *Emission Standards: Existing Incinerators for Hospital/Medical/Infectious Waste.* These emission factors have been incoporated into the current Title V Operating Permit for pollutants with applicable requirements. Other pollutants' emission factors are based on AP-42, Chapter 2.3 and site-specific data.

[c] Exhaust gas parameters are taken from the January 2013 performance test at the North Salt Lake facility.

Exhaust Gas Parameters: [c]

5,662 dscfm
12.80 % O_2

Operating Parameters:

8,760 hr/year
1,984 lb waste/hr

Molecular Weight:

CO	28.00 lb/lbmole
SO_2	64.06 lb/lbmole
NO_2	46.01 lb/lbmole
HCl	36.45 lb/lbmole
NH_3	17.03 lb/lbmole

Table 2

Stericycle, Inc. - North Salt Lake, UT Facility

Summary of Incinerator Proposed Emissions (Following Additional Retrofits and Implementation of New R307-222 Emission Standards)

Pollutant	Emission Factor [a]	Units	Emission Factor Source [b]	Throughput	Units	Proposed Emissions	
						lb/hr	tons/yr
PM/PM_{10}	0.011	gr/dscf @ 7% O_2	R307-222-3(1)	197,966	dscf/hr @ 7% O_2	0.31	1.36
CO	11	ppmv @ 7% O_2	R307-222-3(1)	3,299	dscf/min @7% O_2	0.16	0.69
SO_2	9	ppmv @ 7% O_2	R307-222-3(1)	3,299	dscf/min @7% O_2	0.30	1.30
NO_x	140	ppmv @ 7% O_2	R307-222-3(1)	3,299	dscf/min @7% O_2	3.31	14.49
VOC	4.71E-02	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	4.67E-02	0.20
Hydrogen Chloride	6.6	ppmv @ 7% O_2	R307-222-3(1)	3,299	dscf/min @7% O_2	0.12	0.54
Dioxins/Furans	4.1	gr/10^9 dscf @ 7% O_2	R307-222-3(1)	197,966	dscf/hr @ 7% O_2	1.16E-07	5.08E-07
Lead	0.016	gr/10^3 dscf @ 7% O_2	R307-222-3(1)	197,966	dscf/hr @ 7% O_2	4.52E-04	1.98E-03
Cadmium	0.0040	gr/10^3 dscf @ 7% O_2	R307-222-3(1)	197,966	dscf/hr @ 7% O_2	1.13E-04	4.95E-04
Chlorine	1.05E-01	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	1.04E-01	4.56E-01
Mercury	0.0079	gr/10^3 dscf @ 7% O_2	R307-222-3(1)	197,966	dscf/hr @ 7% O_2	2.23E-04	9.79E-04
Aluminum	3.03E-03	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	3.01E-03	1.32E-02
Antimony	2.10E-04	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	2.08E-04	9.12E-04
Arsenic	1.19E-05	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	1.18E-05	5.17E-05
Barium	7.39E-05	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	7.33E-05	3.21E-04
Beryllium	6.25E-06	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	6.20E-06	2.72E-05
Chromium	3.06E-04	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	3.04E-04	1.33E-03
Copper	1.25E-03	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	1.24E-03	5.43E-03
Hydrogen Bromide	4.33E-02	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	4.30E-02	1.88E-01
Hydrogen Fluoride	1.49E-01	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	1.48E-01	6.47E-01
Iron	1.44E-02	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	1.43E-02	6.26E-02
Manganese	5.67E-04	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	5.62E-04	2.46E-03
Nickel	4.54E-04	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	4.50E-04	1.97E-03
Silver	6.65E-05	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	6.60E-05	2.89E-04
SO_3	9.07E-03	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	9.00E-03	3.94E-02
Thallium	1.10E-03	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	1.09E-03	4.78E-03
Total PCBs	4.65E-05	lb/ton	AP-42 Chapter 2.3	1,984	lbs waste/hr	4.61E-05	2.02E-04
Ammonia	1.00	ppm	Engineering Estimate	3,299	dscf/min @7% O2	8.75E-03	3.83E-02
CO_2e	-	-	-	-	-	2,484.04	10,880.09
CO_2 [d]	147.23	lb/MMBtu	*2012 stack test*	*16.86*	*MMBtu/hr*	2,482.87	10,874.97
CH_4	0.05	lb/ton	*AP-42 Chapter 2.3*	*1,984*	*lbs waste/hr*	4.67E-02	2.05E-01
Total HAPs	-	-	-	-	-	0.38	1.66

[a] Stericycle received approval to add SNCR to aid in NO_X control via Approval Order No. DAQE-AN101420010-13 issued on January 8, 2013, but will remain subject to the NO_X emission limit of 250 ppmv @ 7% O_2 until the amended 40 CFR Part 60, Subpart Ce and R307-222 NO_X emission limit of 140 ppmv @ 7% O_2 becomes applicable.

[b] Emission factors from UAC Rule R307-222-3(1) - *Emission Standards: Existing Incinerators for Hospital/Medical/Infectious Waste.* Other pollutants' emission factors are based on AP-42, Chapter 2.3 and site-specific data.

[c] Exhaust gas parameters are taken from the January 2013 performance test at the North Salt Lake facility.

[d] The use of urea could result in an increase of CO_2. However, Stericycle understands that greenhouse gases do not impact the applicability of the reduction in air contaminant provisions based on correspondence with UDAQ and has not quantified emissions of CO_2 from the use of urea herein.

Exhaust Gas Parameters: [c]

5,662 dscfm
12.80 % O_2

Operating Parameters:

8,760 hr/year
1,984 lb waste/hr

Molecular Weight:

CO	28.00 lb/lbmole
SO_2	64.06 lb/lbmole
NO_2	46.01 lb/lbmole
HCl	36.45 lb/lbmole
NH_3	17.03 lb/lbmole

Table 3
Stericycle, Inc. - North Salt Lake, UT Facility
Existing Emergency Generator Potential Emissions

Pollutant	Emission Factor	Emissions from Emergency Generator	
		(lb/hr)[a]	(ton/yr)[b]
Criteria Pollutants			
NO_x	0.031 lb/hp-hr [c]	8.31	2.08
CO	6.68E-03 lb/hp-hr [c]	1.79	0.45
SO_x	2.05E-03 lb/hp-hr [c]	0.55	0.14
PM/PM_{10}	2.20E-03 lb/hp-hr [c]	0.59	0.15
VOC	2.47E-03 lb/hp-hr [c]	0.66	0.17
GHGs			
CO_2e[f]	- -	307.17	76.79
CO_2	73.96 kg CO_2/mmBtu [d]	306.12	76.53
CH_4	3.00E-03 kg CO_2/mmBtu [d]	1.24E-02	3.10E-03
N_2O	6.00E-04 kg CO_2/mmBtu [d]	2.48E-03	6.21E-04
HAPs			
Benzene	9.33E-04 lb/MMBtu [e]	1.75E-03	4.38E-04
Toluene	4.09E-04 lb/MMBtu [e]	7.68E-04	1.92E-04
Xylenes	2.85E-04 lb/MMBtu [e]	5.35E-04	1.34E-04
1,3-Butadiene	3.91E-05 lb/MMBtu [e]	7.34E-05	1.84E-05
Formaldehyde	1.18E-03 lb/MMBtu [e]	2.22E-03	5.54E-04
Acetaldehyde	7.67E-04 lb/MMBtu [e]	1.44E-03	3.60E-04
Acrolein	9.25E-05 lb/MMBtu [e]	1.74E-04	4.34E-05
Naphthalene	8.48E-05 lb/MMBtu [e]	1.59E-04	3.98E-05

[a] Short term emission rates calculated assuming that a 200 kW (268 HP) emergency generator operates at full capacity.

[b] Annual emissions calculated assuming 500 hours of operation per year.

[c] Emission factors from Chapter 3.3, Table 3.3-1 of U.S. EPA's AP-42 Compilation of Air Pollutant Emission Factors.

[d] Emission factors from 40 CFR 98 Tables C-1 and C-2.

[e] Emission factors from Chapter 3.3, Table 3.3-2 of U.S. EPA's AP-42 Compilation of Air Pollutant Emission Factors.

[f] CO_2e is carbon dioxide equivalent, calculated according to 40 CFR 98 Equation A-1:

$$CO_2e = \sum_{i=1}^{n} GHG_i \times GWP_i$$

where GHG_i = annual mass emissions of greenhouse gas i (metric tons/year)

GWP_i = global warming potential of greenhouse gas i from Table A-1 (below)

Table A-1	
Pollutant	*GWP (100 year)*
CO_2	1
CH_4	25
N_2O	298

Table 4
Stericycle, Inc. - North Salt Lake, UT Facility
New Emergency Generator Potential Emissions

Pollutant	Emission Factor	Emissions from Emergency Generator	
		(lb/hr)[a]	(ton/yr)[b]
Criteria Pollutants			
NO_X	6.2 g/kW-hr[f]	7.81	0.48
NMHC + NO_X	6.4 g/kW-hr[f]	8.0	0.49
CO	3.5 g/kW-hr[f]	4.38	0.27
SO_x[g]	8.09E-04 lb/hp-hr [c]	0.62	0.04
PM/PM_{10}	2.00E-01 g/kW-hr[f]	0.25	0.02
VOC	7.05E-04 lb/hp-hr [c]	5.37E-01	3.28E-02
GHGs			
CO_2e[h]	- -	820.39	50.04
CO_2	73.96 kg CO_2/mmBtu [d]	817.58	49.87
CH_4	3.00E-03 kg CO_2/mmBtu [d]	0.03	2.02E-03
N_2O	6.00E-04 kg CO_2/mmBtu [d]	0.01	4.05E-04
HAPs			
Benzene	7.76E-04 lb/MMBtu[e]	3.89E-03	2.37E-04
Toluene	2.81E-04 lb/MMBtu[e]	1.41E-03	8.59E-05
Xylenes	1.93E-04 lb/MMBtu[e]	9.68E-04	5.90E-05
Formaldehyde	7.89E-05 lb/MMBtu[e]	3.96E-04	2.41E-05
Acetaldehyde	2.52E-05 lb/MMBtu[e]	1.26E-04	7.71E-06
Acrolein	7.88E-06 lb/MMBtu[e]	3.95E-05	2.41E-06
Naphthalene	1.30E-04 lb/MMBtu[e]	6.52E-04	3.98E-05

[a] Short term emission rates calculated assuming that a 568 kW (350 ekW, 762 HP) emergency generator operates at full capacity.

[b] Annual emissions calculated assuming 122 hours of operation per year.

[c] Emission factors from Chapter 3.4, Table 3.4-1 of U.S. EPA's AP-42 Compilation of Air Pollutant Emission Factors.

[d] Emission factors from 40 CFR 98 Tables C-1 and C-2.

[e] Emission factors from Chapter 3.4, Table 3.4-3 and 3.4-4 of U.S. EPA's AP-42 Compilation of Air Pollutant Emission Factors.

[f] Emission factors from 40 CFR 89.112 Tier 2 Emission Standards for kW>560 power rating. (The NO_x factor was calculated by applying the ratio of NOx to NMHC in AP-42 to the "NMHC + NO_x" factor.)

[g] Emission factor based on diesel fuel sulfur content of 0.1%, according to Phillips 66 Company No. 2 Diesel Fuel MSDS.

[h] CO_2e is carbon dioxide equivalent, calculated according to 40 CFR 98 Equation A-1:

$$CO_2e = \sum_{i=1}^{n} GHG_i \times GWP_i$$

where GHG_i = annual mass emissions of greenhouse gas i (metric tons/year)

GWP_i = global warming potential of greenhouse gas i from Table A-1 (below)

Table A-1	
Pollutant	*GWP (100 year)*
CO_2	1
CH_4	25
N_2O	298

Table 5
Stericycle, Inc. - North Salt Lake, UT Facility
Summary of Emission Reductions

Pollutants	Permitted Emissions (tons/year)		Emissions Increases (tons/year)		Proposed Emissions (tons/year)	
Criteria Pollutants						
PM_{10}	2.01		-0.63		1.38	
$PM_{2.5}$	2.01		-0.63		1.38	
NO_X [a]	2.08		-1.60		0.48	
SO_2	8.07		-6.73		1.33	
CO	2.97		-2.01		0.96	
VOC	0.37		-0.13		0.24	
Greenhouse Gases [b]	**Mass Basis**	**CO_2e**	**Mass Basis**	**CO_2e**	**Mass Basis**	**CO_2e**
CO_2	10,951.50	10,951.50	-26.66	-26.66	10,924.85	10,924.85
CH_4	0.21	5.19	-1.08E-03	-0.03	0.21	5.17
N_2O	6.21E-04	0.19	-2.16E-04	-0.06	4.05E-04	0.12
HFCs	N/A		N/A		N/A	
PFCs	N/A		N/A		N/A	
SF_6	N/A		N/A		N/A	
Total HAPs	8.31		-7.76		0.55	
HCl	8.21		-7.66		0.54	
D/F	6.81E-06		-6.31E-06		5.08E-07	
Pb	6.44E-02		-6.24E-02		1.98E-03	
Cd	8.67E-03		-8.18E-03		4.95E-04	
Hg	2.97E-02		-2.88E-02		9.79E-04	
Benzene	4.38E-04		-2.01E-04		2.37E-04	
Toluene	1.92E-04		-1.06E-04		8.59E-05	
Xylenes	1.34E-04		-7.47E-05		5.90E-05	
1,3-Butadiene	1.84E-05		-1.84E-05		0.00	
Formaldehyde	5.54E-04		-5.30E-04		2.41E-05	
Acetaldehyde	3.60E-04		-3.52E-04		7.71E-06	
Acrolein	4.34E-05		-4.10E-05		2.41E-06	
Naphthalene	3.98E-05		-3.89E-08		3.98E-05	

[a] Changes to emissions of NOx reflect only the replacement of the emergency generator. NOx from the incinerator was addressed in a previous application for the addition of SNCR.

[b] CO_2e is carbon dioxide equivalent, calculated according to 40 CFR 98 Equation A-1:

$$CO_2e = \sum_{i=1}^{n} GHG_i \times GWP_i$$

where GHG_i = annual mass emissions of greenhouse gas i (metric tons/year)
GWP_i = global warming potential of greenhouse gas i from Table A-1 (below)

Table A-1	
Pollutant	*GWP (100 year)*
CO_2	1
CH_4	25
N_2O	298

UTAH DIVISION OF AIR QUALITY
SOURCE PLAN REVIEW

Al Burson
Stericycle Incorporated
28161 North Keith Drive
Lake Forest, IL 600450

Project Number: N101420011

RE:	Administrative Amendment to AO DAQE-AN101420010-13 for Retrofits to Existing Air Pollution Control Device System Davis County; CDS B; MACT (Part 63), Nonattainment or Maintenance Area, Title V (Part 70) major source, NSPS (Part 60)
Review Engineer:	Jon Black
Date:	July 16, 2014
Notice of Intent Submitted:	March 7, 2014
Plant Contact:	Al Burson
Phone Number:	(847) 370-7995
Source Location:	90 North 1100 West, North Salt Lake, UT Davis County 4521849 m Northing, 420687 m Easting, UTM Zone 12 UTM Datum: NAD27

DAQ requests that a company/corporation official read the attached draft/proposed Plan Review with Recommended Approval Order Conditions. If this person does not understand or does not agree with the conditions, the review engineer should be contacted within five days after receipt of the Plan Review. If this person agrees with the Plan Review and Recommended Approval Order Conditions, this person should sign below and return (FAX # 801-536-4099) within 10 days after receipt of the conditions. If the review engineer is not contacted within 10 days, the review engineer shall assume that the company/corporation official agrees with this Plan Review and will process the Plan Review towards final approval. A public comment period will be required before the Approval Order can be issued.

Applicant Contact _____
(Signature & Date)

OPTIONAL: In order for this Source Plan Review and associated Approval Order conditions to be administratively included in your Operating Permit (Application), the Responsible Official as defined in R307-415-3, must sign the statement below and the signature above is not necessary. THIS IS STRICTLY OPTIONAL!

If you do not desire this Plan Review to be administratively included in your Operating Permit (Application), only the Applicant Contact signature above is required. Failure to have the Responsible Official sign below will not delay the Approval Order, but will require a separate update to your Operating Permit Application or a request for modification of your Operating Permit, signed by the Responsible Official, in accordance with R307--415-5a through 5e or R307-415-7a through 7i.

"Based on reasonable inquiry, I certify that the information provided for this Approval Order has been true, accurate and complete and request that this Approval Order be administratively amended to the Operating Permit (Application)."

Responsible Official _____
(Signature & Date)

Print Name of Responsible Official _____

OPTIONAL: In order for this Source Plan Review and associated Approval Order conditions to be administratively included in your Operating Permit (Application), the Responsible Official as defined in R307-415-3, must sign the statement below and the signature above is not necessary. THIS IS STRICTLY OPTIONAL!

If you do not desire this Plan Review to be administratively included in your Operating Permit (Application), only the Applicant Contact signature above is required. Failure to have the Responsible Official sign below will not delay the Approval Order, but will require a separate update to your Operating Permit Application or a request for modification of your Operating Permit, signed by the Responsible Official, in accordance with R307--415-5a through 5e or R307-415-7a through 7i.

"Based on reasonable inquiry, I certify that the information provided for this Approval Order has been true, accurate and complete and request that this Approval Order be administratively amended to the Operating Permit (Application)."

Responsible Official _____ 7/8/14
(Signature & Date)

Print Name of Responsible Official Dale C. Rich

ABSTRACT

Stericycle, Inc., (Stericycle) has requested equipment retrofits and replacements to AO DAQE-AN101420010-13 for its hospital, medical, and infectious waste incinerator (HMIWI) facility. The retrofitting activities are to upgrade the air pollution control system. The requested changes will consist of replacement of a gas cooler with a new evaporative cooler, replacement of an electrostatic precipitator with a baghouse, replacement of the wet gas absorber with a new absorber, addition of a carbon bed downstream of the absorber, and include urea or an equivalent reagent for control of NO_x emissions through the existing SNCR system. The existing emergency diesel generator will also be replaced with a new more efficient generator which can handle loss of power at the facility. The emergency diesel generator replacement will minimize bypass events by avoiding the loss of power. Waste delivery, processing, and unloading activities will not change, nor will any other changes be made to the HMIWI.

Stericycle is located in Davis County, which is a nonattainment area of the NAAQS for $PM_{2.5}$ and a maintenance area for Ozone. Davis County is attainment for all other pollutants. NSPS 40 CFR 60 Subparts A, Ce, and IIII regulations apply. MACT 40 CFR 63 Subparts A and ZZZZ regulations apply to this source. Title V of the 1990 Clean Air Act applies to this source. The Title V Operating Permit applies to HMIWI facilities and will be Administratively Amended to incorporate the conditions of this Enhanced AO.

The retrofits at this facility along with a limitation on the emergency diesel generator hours of operation, will create an emissions reduction in all criteria and HAP emissions. Therefore this permit action will qualify under R307-401-12 (Reduction in Air Contaminants) and will be processed as an Administrative Amendment. Stericycle will remain limited to specific emission concentrations listed in 40 CFR 60 Subpart Ce, R307-222 and R307-201-3. The emission reductions from the retrofits, in tons per year, are as follows: Particulate Matter (-0.63), PM_{10} (-0.63), $PM_{2.5}$ (-0.63), NO_x (-1.60), SO_2 (-6.73), CO (-2.01), VOC (-0.13), HAPs (-7.76) and CO_2e (-26.75).

The controlled potential to emit emissions, in tons per year, will be as follows beginning October 6, 2014: Particulate Matter = 1.38, PM_{10} = 1.38, $PM_{2.5}$ (Subset of PM_{10}) = 1.38, NO_x = 14.97, SO_2 = 1.33, CO = 0.96, VOC = 0.24, Total HAPs = 1.66 and CO_2e = 10,930.13.

SOURCE SPECIFIC DESIGNATIONS

Applicable Programs:

NSPS (Part 60), Subpart A: General Provisions applies to Hospital, Medical, Infectious Waste Incinerator
NSPS (Part 60), Subpart Ce: Emission Guidelines and Compliance Times for Hospital/Medical/Infectious Waste Incinerators applies to Hospital, Medical, Infectious Waste Incinerator
NSPS (Part 60), Subpart IIII: Standards of Performance for Stationary Compression Ignition Internal Combustion Engines applies to Emergency Generator
MACT (Part 63), Subpart A: General Provisions applies to Hospital, Medical, Infectious Waste Incinerator
MACT (Part 63), Subpart ZZZZ: National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines applies to Emergency Generator
Title V (Part 70) major source applies to Hospital, Medical, Infectious Waste Incinerator

Davis County O3 Maintenance Area applies to Hospital, Medical, Infectious Waste Incinerator
Davis County $PM_{2.5}$ NAA applies to Hospital, Medical, Infectious Waste Incinerator

Permit History:

When issued, the approval order shall supersede or will be based on the following documents:

Is Derived From	Notice of Intent dated March 7, 2014
Replaces	AO DAQE-AN101420010-13 dated January 8, 2013
Incorporates	Additional NOI Information dated March 24, 2014
Incorporates	Additional Source Information dated April 3, 2014
Incorporates	Additional Source Information dated June 20, 2014

Nonattainment or Maintenance Areas Impacted:
Davis County O3 Maintenance Area
Davis County $PM_{2.5}$ NAA

SUMMARY OF NOTICE OF INTENT INFORMATION

Description of Proposal:

Stericycle operates an existing HMIWI in North Salt Lake. Stericycle is subject to the Title V permitting program due to being subject to UDAQ's HMIWI regulations (R307-222) and U.S. EPA's HMIWI Emission Guidelines (40 CFR Part 60 Subpart Ce). Stericycle is proposing retrofits to the existing air pollution control system in order to achieve compliance with more stringent emission limitations promulgated to 40 CFR Part 60, Subpart Ce on October 6, 2009.

Current Process Description:
The HMIWI operation begins with all waste containers being delivered to the facility and maintained in a secured collection vehicle until processed. When processing begins, the collection vehicle is staged at the dock area where only assigned material handlers unload the waste containers from the collection vehicle. The containers are then staged manually next to the charge hopper. The incinerator operator weighs each container, scans a bar code to document receipt, and monitors the waste for possible radioactivity. The operator then loads the waste from the container into the feed conveyor and charge hopper.

The waste is then introduced into the primary stage of the incinerator via a dual door ram feed system. The residence time of the waste in the primary chamber is approximately 4-8 hours. The secondary chamber has a designed extended residence time which allows for complete oxidation and combustion of the primary chamber exhaust gas. There are two natural gas fired burners in the primary chamber and one natural gas fired burner in the secondary chamber which are utilized to maintain the combustion temperature.

The exhaust gas from the secondary chamber of the incinerator is directed into a waste heat boiler. The flue gas from the boiler enters the gas cooler and, upon its exit, carbon and sodium bicarbonate are added. The injection of carbon aids in better control and removes dioxin furans and mercury from the flue gas. The addition of sodium bicarbonate also neutralizes the flue gas before it enters into the electrostatic precipitator. The flue gas exiting the ESP then enters the wet gas absorber, where it is in direct contact with a sodium hydroxide system which balances the flue gas pH prior to venting to the atmosphere.

Proposed Process Description:
Stericycle is proposing the following retrofit activities to the existing air pollution control device systems:

1) Replace the gas cooler with a new evaporative cooler.
2) Inject sodium bicarbonate, lime or equivalent.
3) Replace the ESP with a baghouse.
4) Replace the wet gas absorber with a new absorber.
5) Add a carbon bed downstream of the absorber.
6) Include the use of ammonia, urea, or an equivalent reagent in order to control NO_x emissions through the existing SNCR system.
7) Replacement of an existing 200 hp emergency diesel generator with a new 762 hp emergency diesel generator.

The process will now involve exhaust gas from the secondary chamber of the incinerator to be injected with a reagent (ammonia, urea, or equivalent reagent) to control NO_x emissions from the SNCR system prior to being fed into the waste heat boiler. The flue gas from the boiler enters the new evaporative cooler and, upon its exit, carbon and lime are now added. The injection of carbon helps to better control and remove dioxin/furans and mercury from the flue gas. The injection of lime neutralizes the flue gas before it enters the new baghouse. After the baghouse, the flue gas enters the new absorber, where it is in direct contact with a sodium hydroxide system. The sodium hydroxide system balances the flue gas pH, prior to routing the exhaust gases to the carbon beds and then venting to the atmosphere.

Waste delivery, processing, and unloading activities will not change, nor will any other changes be made to the HMIWI. There will be reductions in all criteria and HAP emissions

Summary of Emission Totals:

The emissions listed below are an estimate of the total potential emissions from the source. Some rounding of emissions is possible.

Estimated Criteria Pollutant Potential Emissions

Ammonia	0.04	tons/yr
CO_2 Equivalent	10930.13	tons/yr
Carbon Monoxide	0.96	tons/yr
Nitrogen Oxides	14.97	tons/yr
Particulate Matter	1.38	tons/yr
Particulate Matter - PM_{10}	1.38	tons/yr
Particulate Matter - $PM_{2.5}$	1.38	tons/yr
Sulfur Dioxide	1.33	tons/yr
Volatile Organic Compounds	0.24	tons/yr

Estimated Hazardous Air Pollutant Potential Emissions

Antimony (TSP) (CAS #7440360)	2	lbs/yr
Arsenic (TSP) (CAS #7440382)	0.103	lbs/yr
Beryllium (TSP) (CAS #7440417)	0.054	lbs/yr
Cadmium (CAS #7440439)	1	lbs/yr
Chlorine (CAS #7782505)	912	lbs/yr
Chromium Compounds (CAS #CMJ500)	3	lbs/yr

Dioxin/Furan Toxic Equivalents: 2,3,7,8-Tetrachlorodibenzo-P-Dioxin (CAS #1746016)	0.001	lbs/yr
Generic HAPs (CAS #GHAPS)	20	lbs/yr
Hydrochloric Acid (Hydrogen Chloride) (CAS #7647010)	1084	lbs/yr
Hydrogen Fluoride (Hydrofluoric Acid) (CAS #7664393)	1296	lbs/yr
Lead (CAS #7439921)	4	lbs/yr
Manganese (TSP) (CAS #7439965)	5	lbs/yr
Mercury (TSP) (CAS #7439976)	2	lbs/yr
Total hazardous air pollutants	1.66	tons/yr

Review of Best Available Control Technology:

1. BACT review regarding Retrofits and Replacement Equipment
   Stericycle is proposing the following retrofit activities to the existing air pollution control device systems:

   1) Replace the gas cooler with a new evaporative cooler.
   2) Inject sodium bicarbonate, lime or equivalent.
   3) Replace the ESP with a baghouse.
   4) Replace the wet gas absorber with a new absorber.
   5) Add a carbon bed downstream of the absorber.
   6) Include the use of ammonia, urea, or an equivalent reagent in order to control NO_x emissions through the existing SNCR system.
   7) Replacement of an existing 200 hp emergency diesel generator with a new 762hp emergency diesel generator.

   These changes create an emissions reduction in all criteria and HAP air contaminants. Therefore the project qualifies for the changes under R307-401-12 (Reduction in Air Contaminants) and it is not required to do a BACT analysis.
   [Last updated June 30, 2014]

Modeling Results:

This project is for retrofits to the existing air pollution control system and will create emission reductions in all criteria and HAP air contaminants. The reductions of all regulated pollutants do not trigger any modeling thresholds. Therefore modeling is not required per R307-410.
[Last updated March 26, 2014]

RECOMMENDED APPROVAL ORDER CONDITIONS

The intent is to issue an air quality Approval Order (AO) authorizing the project with the following recommended conditions and that failure to comply with any of the conditions may constitute a violation of the AO. The AO will be issued to and will apply to the following:

Name of Permittee:

Stericycle Incorporated
28161 North Keith Drive
Lake Forest, IL 600450

Permitted Location:

Stericycle Incorporated:
BFI Medical Waste Incinerator
90 North 1100 West
North Salt Lake, UT 84054

UTM coordinates: 420687 m Easting, 4521849 m Northing, UTM Zone 12
SIC code: 4953 (Refuse Systems)

Section I: GENERAL PROVISIONS

I.1 All definitions, terms, abbreviations, and references used in this AO conform to those used in the UAC R307 and 40 CFR. Unless noted otherwise, references cited in these AO conditions refer to those rules. [R307-101]

I.2 The limits set forth in this AO shall not be exceeded without prior approval. [R307-401]

I.3 Modifications to the equipment or processes approved by this AO that could affect the emissions covered by this AO must be reviewed and approved. [R307-401-1]

I.4 All records referenced in this AO or in other applicable rules, which are required to be kept by the owner/operator, shall be made available to the Director or Director's representative upon request, and the records shall include the two-year period prior to the date of the request. Unless otherwise specified in this AO or in other applicable state and federal rules, records shall be kept for a minimum of five (5) years. [R307-401-8]

I.5 At all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any equipment approved under this Approval Order including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Director which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source. All maintenance performed on equipment authorized by this AO shall be recorded. [R307-401-4]

I.6 The owner/operator shall comply with UAC R307-107. General Requirements: Breakdowns. [R307-107]

I.7 The owner/operator shall comply with UAC, R307-150 Series. Inventories, Testing and Monitoring. In addition to the requirements of UAC, R307-150 the owner/operator shall comply with more frequent inventory submittals as required by the Utah State Plan for Hospital, Medical, Infectious Waste Incinerators as required under R307-220-3 and R307-222. [R307-150, R307-220-

3, R307-222]

Section II: SPECIAL PROVISIONS

II.A The approved installations shall consist of the following equipment:

II.A.1 **Hospital, Medical, Infectious Waste Incinerator**
Site Wide

II.A.2 **Incinerator (designated as HMIWI)**
One (1) incinerator

Manufacturer: Joy Energy System, Inc
Maximum Design Feed Rate: 2,500 lbs of waste charged per hour
Model: TES2500

Equipped with natural gas-fired auxiliary burners, a bypass stack, automated waste feed system and ash removal system.

II.A.3 **Incinerator Emissions Control System**
HMIWI emission control system includes:

One (1) evaporative gas cooler*
One (1) carbon, sodium bicarbonate, lime, and/or equivalent injection system*
One (1) baghouse*
One (1) wet gas absorber*
One (1) scrubbing system
One (1) carbon bed*
One (1) selective non-catalytic reduction (SNCR) system (New equipment added in 2012)

* Retrofits to commence in 2014

Note: The injection system will remove and control dioxin/furan and mercury. The SNCR system controls NO_x emissions.

II.A.4 **Waste Heat Boiler**
One (1) natural gas-fired boiler

Manufacturer: Superior Boiler
Model No. Apache 11S8-WH-2904
Maximum Capacity: 11,078 lbs/hr of 200 psi steam or equivalent.

II.A.5 **Sodium Bicarbonate, Lime, or Equivalent Silo**
One (1) sodium bicarbonate, lime or equivalent silo equipped with a fabric filter.

II.A.6 **Emergency Generator**
One (1) Emergency Generator
Fuel Type: Diesel
Maximum Generator Rating: 762 hp

II.A.7 **Support Facilities**
On-site support equipment consisting of refrigerated storage facilities for medical waste are noted as being located on the property but do not emit air contaminants.

II.B Requirements and Limitations

II.B.1 **The Hospital, Medical, and Infectious Waste incinerator (HMIWI) Facility Requirements:**

II.B.1.a The owner/operator shall notify the Director in writing when the installation of the new retrofit equipment listed in Conditions II.A.3 and II.A.6 have been completed and are operational. To ensure proper credit when notifying the Director, send your correspondence to the Director, attn: Compliance Section.

If installation has not been completed within 18 months from the date of this AO, the Director shall be notified in writing on the status of the construction and/or installation. At that time, the Director shall require documentation of the continuous installation of the operation and may revoke the AO. [R307-401-18]

II.B.1.b The owner/operator shall operate its HMIWI in accordance with 40 CFR 60 Subpart Ce (Emission Guidelines and Compliance Times for Hospital/Medical/Infectious Waste Incinerators), Utah Rule R307-222 (Emission Standards: Existing Incinerators for Hospital, Medical, Infectious Waste) and the Utah State Plan for Hospital, Medical, Infectious Waste Incinerators as required under R307-220-3 (Section II, Hospital, Medical, Infectious Waste Incinerators). [40 CFR 60 Subpart Ce, R307-220-3, R307-222]

II.B.1.c The owner/operator shall operate the HMIWI below the maximum charge rate on a 3-hour rolling average basis. The maximum charge rate is defined as 110 percent of the lowest 3-hour average charge rate measured during the most recent performance test demonstrating compliance with all applicable emission limits. Records of the waste feed rate shall be kept at all times of incinerator operation and made available to the Director upon request. [40 CFR 60 Subpart Ce, R307-222, R307-401-8]

II.B.1.d Prior to October 6, 2014, emissions to the atmosphere from the indicated emission point shall not exceed the following rates and concentrations:

Source: Incinerator Emission Control System Exhaust Stack

Pollutant	Units (7% Oxygen, dry basis)	Limit
Particulate Matter	Milligrams per dry standard cubic meter (mg/dscm)	34
	Grains per dry standard cubic foot (gr/dscf)	0.015
Carbon Monoxide	Parts per million by volume (ppmv)	40
Dioxin/Furans	Nanograms per dry standard cubic meter total dioxin/furans (ng/dscm)	125

	Grains per billion dry standard cubic feet (gr/10^9 dscf)	55
	or;	
	ng/dscm TEQ	2.3
	gr/10^9dscf TEQ	1.0
Hydrogen Chloride	ppmv or percent reduction	100 or 93%
Sulfur Dioxide	ppmv	55
Nitrogen Oxides	ppmv	250
Lead	mg/dscm	1.2
	grains per thousand dry standard cubic feet (gr/10^3 dscf)	0.52
	or percent reduction	70%
Cadmium	mg/dscm	0.16
	gr/10^3dscf	0.07
	or percent reduction	65%
Mercury	mg/dscm	0.55
	gr/10^3dscf	0.24
	or percent reduction	85%

[40 CFR 60 Subpart Ce]

II.B.1.e Beginning October 6, 2014, emissions to the atmosphere from the indicated emission point shall not exceed the following rates and concentrations:

Source: Incinerator Emission Control System Exhaust Stack

Pollutant	Units (7% Oxygen, dry basis)	Limit
Particulate Matter	Milligrams per dry standard cubic meter (mg/dscm)	25
	Grains per dry standard cubic foot (gr/dscf)	0.011
Carbon Monoxide	Parts per million by volume (ppmv)	11
Dioxin/Furans	Nanograms per dry standard cubic meter total dioxin/furans (ng/dscm)	9.3
	Grains per billion dry standard cubic feet (gr/10^9 dscf)	4.1
	or;	
	ng/dscm TEQ	0.054
	gr/10^9dscf TEQ	0.024
Hydrogen Chloride	ppmv	6.6

Sulfur Dioxide	ppmv	9.0
Nitrogen Oxides	ppmv	140
Lead	mg/dscm	0.036
	grains per thousand dry standard cubic feet (gr/10^3 dscf)	0.016
Cadmium	mg/dscm	0.0092
	gr/10^3dscf	0.0040
Mercury	mg/dscm	0.018
	gr/10^3dscf	0.0079

[40 CFR 60 Subpart Ce]

II.B.1.f An initial stack test to show compliance with the emission limitations stated in Condition II.B.1.e.shall be performed for PM, CO, HCl, Dioxin/Furan, SO_2, NOx, Pb, Cd, and Hg. The stack test shall be performed within 180 days of the installation of the Incinerator Emission Control System as designated in Condition II.A.3 of this AO or by October 6, 2014, whichever is later. Subsequent stack testing shall be performed for PM, CO, and HCl once per calendar year in accordance with 40 CFR 60 Subpart Ce, R307-222 and the Utah State HWIMI Plan. The annual testing frequency can be reduced to once every three years if all three performance tests over a 3-year period indicate compliance with the emission limits for each of the three pollutants. The frequency shall return to annual testing for a particular pollutant if a performance test for that pollutant indicates noncompliance with the respective emission limit. Upon operation of NO_x and CO CEMS as described in Condition II.B.1.g, stack testing for NO_x and CO will not be required. The use of the bypass stack during a stack test shall invalidate the stack test. [40 CFR 60 Subpart Ce, R307-222]

II.B.1.f.1 Each stack test shall consist of a minimum of three test runs conducted under representative operating conditions. When testing is required, Dioxin/Furan, Pb, Cd, and Hg shall be tested simultaneously, and the minimum sample time shall be 4 hours per test run unless otherwise indicated. When testing is required, PM, CO, HCl, SO_2, and NOX shall be tested simultaneously, and the minimum sample time shall be 1 hour per test run unless otherwise indicated. All stack testing data and results shall be submitted to the Director within 60 days of the testing date(s). [R307-165, R307-401-8]

II.B.1.f.2 Notification

The Director shall be notified at least 30 days prior to conducting any required emission testing. A source test protocol shall be submitted to DAQ when the testing notification is submitted to the Director.

The source test protocol shall be approved by the Director prior to performing the test(s). The source test protocol shall outline the proposed test methodologies, stack to be tested, and procedures to be used. A pretest conference shall be held, if directed by the Director. [R307-

165]

II.B.1.f.3 Existing Source Operation: For an existing source/emission point, the production rate during all compliance testing shall be no less than 90% of the maximum production achieved in the previous three (3) years. [R307-165]

II.B.1.f.4 Sample Location

The emission point shall be designed to conform to the requirements of 40 CFR 60, Appendix A, Method 1, or other EPA-approved testing method, as acceptable to the Director. An Occupational Safety and Health Administration (OSHA) or Mine Safety and Health Administration (MSHA) approved access shall be provided to the test location. [R307-165]

II.B.1.f.5 Volumetric Flow Rate

40 CFR 60, Appendix A, Method 2. [R307-165]

II.B.1.f.6 Particulate Matter

40 CFR 60, Method 5 of Appendix A-3, 26A or 29 of Appendix A-8 or other EPA approved method as acceptable to the Director. [R307-165]

II.B.1.f.7 Carbon Monoxide

40 CFR 60, Method 10 or 10B of Appendix A-4 or other EPA approved method as acceptable to the Director. [R307-165]

II.B.1.f.8 Dioxins/furans

40 CFR 60, Method 23 of Appendix A-7 or other EPA approved method as acceptable to the Director. [R307-165]

II.B.1.f.9 Hydrogen Chloride

40 CFR 60, Method 26 or 26A of Appendix A-8 or other EPA approved method as acceptable to the Director. [R307-165]

II.B.1.f.10 Sulfur Dioxide

40 CFR 60, Method 6 or 6C of Appendix A-4 or other EPA approved method as acceptable to the Director. [R307-165]

II.B.1.f.11 Nitrogen Oxides

40 CFR 60, Method 7 or 7E of Appendix A-4 or other EPA approved method as acceptable to the Director. [R307-165]

II.B.1.f.12 Lead, Cadmium and Mercury

40 CFR 60, Method 29 of Appendix A-8 or other EPA approved method as acceptable to the Director. [R307-165]

II.B.1.g The owner/operator shall operate continuous emissions monitoring systems (CEMS) or other alternative monitoring approach approved by the Director to demonstrate compliance with NO_x and CO emissions limits. An O_2 monitor shall also be installed for adjusting the readings to percent O_2. Compliance with the NO_x and CO emission limits shall be demonstrated using a 12-hour rolling average, calculated each hour as the average of the previous 12 operating hours and not including startup, shutdown, or malfunction. While the affected emission unit is operating, hourly NO_x and CO emission rates expressed in ppmv shall be determined in accordance with R307-170 using the appropriate conversion factors. The CEMS shall be installed and operating no later than 18 months from the issuance date of this AO, unless an approved alternative is implemented. Prior to the installation and operation of the NO_x and CO CEMS, compliance with the NO_x and CO emissions limits shall be demonstrated by maintaining the minimum and maximum operating parameters identified in Conditions II.B.1.h and II.B.1.i.1 in accordance with 40 CFR 62 Subpart HHH and R307-222. CEMS shall be installed, calibrated, operated, and maintained in accordance with R307-170. [R307-170, R307-222]

II.B.1.h Prior to the installation and operation of the CO CEMS, as described in Condition II.B.1.g, operating above the maximum charge rate (3-hour rolling average) and below the minimum secondary chamber temperature (3-hour rolling average) simultaneously constitutes a violation of the CO emissions limit. [R307-222]

II.B.1.i The SNCR system shall inject ammonia, urea or an equivalent reagent into the incinerator's secondary chamber exhaust stream prior to the exhaust gas being fed into the waste heat boiler. All equivalent reagents shall be approved by the Director. [R307-401-8]

II.B.1.i.1 The owner/operator shall establish the minimum reagent flow rate based on performance testing. The minimum reagent flow rate means 90 percent of the highest 3-hour average injection rate (taken, at a minimum, once every minute) measured during the most recent performance test demonstrating compliance with the NO_x emission limit. Prior to the installation and operation of the NO_x CEMS, as described in Condition II.B.1.g, operating above the maximum charge rate (3-hour rolling average), below the minimum secondary chamber temperature (3-hour rolling average), and below the minimum reagent flow rate (3-hour rolling average) simultaneously constitutes a violation of the NO_x emissions limit. [R307-222, R307-401-8]

II.B.1.i.2 The owner/operator shall record the amount and type of NO_x reagent used during each hour of

operation. [R307-401-8]

II.B.1.j The baghouse shall operate in accordance with the following:

A) The pressure drop of the baghouse shall not be less than one (1) inches of water column or more than ten (10) inches of water column.

B) The baghouse operating parameters shall be monitored with equipment located such that an inspector/operator can safely read the output any time. The pressure drop readings shall be accurate to within plus or minus 0.5 inches of water column.

C) All instruments shall be calibrated according to the manufacturer's instructions. [R307-401-8]

II.B.1.k The owner/operator shall not allow visible emissions to exceed the following:

A) All baghouse emission points - 10% opacity
B) Sodium bicarbonate, lime, or equivalent silo emission point - 10% opacity
C) All diesel generator emission points - 20% opacity
D) All other stationary point or fugitive emission sources on site - 20% opacity*

Note: The 20% opacity limitation does not apply to the by-pass stack during by-pass events. [R307-201-3]

II.B.1.k.1 A visual observation of the sodium bicarbonate, lime, or equivalent silo shall be performed once during each filling operation by an individual trained on the observation procedures of 40 CFR 60, Appendix A, Method 9. The individual is not required to be a certified visible emissions observer (VEO). If any visible emissions are observed, filling operations shall be suspended and the dust control device as well as any associated ducting shall be inspected. Any conditions existing outside of normal operational parameters shall be corrected and filling activities may resume. Upon resumption of filling operations a 40 CFR 60, Appendix A, Method 9 opacity determination of the silo shall be performed by a certified observer.

All other opacity observations of emissions from stationary sources shall be conducted according to 40 CFR 60, Appendix A, Method 9.

For sources that are subject to NSPS, opacity shall be determined by conducting observations in accordance with 40 CFR 60.11(b) and 40 CFR 60, Appendix A, Method 9. [R307-203-1]

II.B.1.k.2 Records of visual emission observations shall be kept at all times of filling operations. The records shall include the date, time and visual observation value noted. All records shall be kept in accordance with Condition I.4 of this AO. [R307-401-8]

II.B.2 **Emergency Diesel Generator Requirements**

II.B.2.a The emergency diesel generator shall not exceed 122 hours of operation per rolling 12-month period. [R307-401-8]

II.B.2.a.1 To determine compliance with a rolling 12-month total, the owner/operator shall calculate a new 12-month total for each day of the previous month by the twentieth day of each month using data from the previous 12 months. Hours of operation shall be determined by supervisor monitoring and maintaining of an operations log for the generator. [R307-401-8]

II.B.2.b The sulfur content of any diesel fuel burned in any diesel engine on site shall not exceed 15 ppm. [R307-401-8]

II.B.2.b.1 The sulfur content shall be determined by ASTM Method D2880-71, D4294-89, or approved equivalent. Certification of diesel fuel shall be either by the owner/operator's own testing or by test reports from the diesel fuel marketer. [R307-203-1]

Section III: APPLICABLE FEDERAL REQUIREMENTS

In addition to the requirements of this AO, all applicable provisions of the following federal programs have been found to apply to this installation. This AO in no way releases the owner or operator from any liability for compliance with all other applicable federal, state, and local regulations including UAC R307.

NSPS (Part 60), A: General Provisions
NSPS (Part 60), Ce: Emission Guidelines and Compliance Times for Hospital/Medical/Infectious Waste Incinerators
NSPS (Part 60), IIII: Standards of Performance for Stationary Compression Ignition Internal Combustion Engines
MACT (Part 63), A: General Provisions
MACT (Part 63), ZZZZ: National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines
Title V (Part 70) major source

REVIEWER COMMENTS

The AO will be based on the following documents:

Is Derived From	Notice of Intent dated March 7, 2014
Replaces	AO DAQE-AN101420010-13 dated January 8, 2013
Incorporates	Additional NOI Information dated March 24, 2014
Incorporates	Additional Source Information dated April 3, 2014
Incorporates	Additional Source Information dated June 20, 2014

1. Comment regarding Emission Calculations:
Stericycle's emissions have been calculated based upon site specific test data, current AP-42 emission factors (Chapter 2.3 - Medical Waste Incineration, Chapter 3.3 - Gasoline and Diesel Industrial Engines, and Chapter 3.4 - Large Stationary Diesel Engines); 40 CFR 98 Tables C-1 and C-2, and 40 CFR 89.112 (Tier 2 Emission Standards).

   The calculated emissions with the new retrofits designated in this AO, reflect decreases in all criteria and HAP emissions at this facility. Stericycle will still be limited to specific emission concentrations listed in 40 CFR 60 Subpart Ce, R307-222 -3(1) (Emission Standards: Existing Incinerators for Hospital/Medical/Infectious Waste), which limit the final overall emission rates.

   The source wide emission reductions are as follows:
   PM_{10} (-0.63)
   $PM_{2.5}$ (-0.63)
   NO_x (-1.60)
   SO_2 (-6.73)
   CO (-2.01)
   VOC (-0.13)

   Total source wide HAP emission reductions total (-7.76) which includes the following:
   HCl (-7.66)
   D/F (-6.31 E-06)
   Pb (-6.24 E-02)
   Cd (-8.18 E-03)
   Hg (-2.88 E-02)
   Benzene (-2.01 E-04)
   Toluene (-1.06 E-04)
   Xylenes (-7.47 E-05)
   1,3-Butadiene (-1.84 E-05)
   Formaldehyde (-5.30 E-04)
   Acetaldehyde (-3.52 E-04)
   Acrolein (-4.10 E-05)
   Naphthalene (-3.89 E-08)
   [Last updated April 8, 2014]

2. Comment regarding Emergency Diesel Generator Emission Calculations:
The emission reductions associated with replacement of the generator and assuming 122 hours of operation per year are as follows:

PM_{10} (-0.13)
$PM_{2.5}$ (-0.13)
NO_x (-1.60)
SO_2 (-0.10)
CO (-0.18)
VOC (-0.13)
CO_2e (-26.75)

Total HAPs emission reductions from the emergency generator replacement equals (-1.30 E-03) which includes the following:
Benzene (-2.01 E-04)
Toluene (-1.06 E-04)
Xylenes (-7.50 E-05)
Formaldehyde (-5.30 E-04)
Acetaldehyde (-3.52 E-04)
Acrolein (-4.10 E-05)
Naphthalene (-3.89 E-08)

The emission factors used were based upon the following:
$PM_{10}/PM_{2.5}$: 2.00 E-01 g/kW-hr - (40 CFR 89.112 Tier 2 Emission Standard)
NO_x: 6.2 g/kW-hr - (40 CFR 89.112 Tier 2 Emission Standard)
CO: 3.5 g/kW-hr - (40 CFR 89.112 Tier 2 Emission Standard)
SO_x: 8.09 E-04 lb/hp-hr - (AP 42 Chapter 3.4, Table 3.4-1)
VOC: 7.05 E-04 lb/hp-hr - (AP 42 Chapter 3.4, Table 3.4-1)
Benzene: 7.76 E-04 lb/MMBtu - (AP 42 Chapter3.4, Table 3.4-3)
Toluene: 2.81 E-04 lb/MMBtu - (AP 42 Chapter 3.4, Table 3.4-3)
Xylenes: 1.93 E-04 lb/MMBtu - (AP 42 Chapter 3.4, Table 3.4-3)
Formaldehyde: 7.89 E-05 lb/MMBtu - (AP 42 Chapter 3.4, Table 3.4-3)
Acetaldehyde: 2.52 E-05 lb/MMBtu - (AP 42 Chapter 3.4, Table 3.4-3)
Acrolein: 7.88 E-06 lb/MMBtu - (AP 42 Chapter 3.4, Table 3.4-3)
Naphthalene: 1.30 E-04 lb/MMBtu - (AP 42 Chapter 3.4, Table 3.4-3) [Last updated April 8, 2014]

3. Comment regarding Baghouse Emission Calculation:
The emission reductions associated with replacement of the ESP with a new baghouse are as follows:
TSP (-0.50)
PM_{10} (-0.50)
$PM_{2.5}$ (-0.50)

The emission factor for TSP/PM_{10}/$PM_{2.5}$ was 0.011 gr/dscf @7% O_2. (R307-222-3(1))

TSP/PM_{10}/$PM_{2.5}$ all utilized this emission factor for the potential to emit calculation. [Last updated March 25, 2014]

4. Comment regarding Amendments to 40 CFR Part 60, Subpart Ce:
On October 6, 2009 EPA promulgated amendments to 40 CFR Part 60, Subpart Ce for requirements which contain more stringent emission limitations for particulate matter (PM), carbon monoxide (CO), dioxins/furans (CDD/CDF), hydrogen chloride (HCL), sulfur dioxide

(SO_2), nitrogen oxides (NO_x), lead (Pb), cadmium (Cd), and mercury (Hg). Compliance with the amended Federal rule is required no later than October 6, 2014. Utah DAQ has adopted these amendments to state rule R307-222 (Emission Standards: Existing Incinerators for Hospital, Medical, Infectious Waste) and the Utah State Plan for Hospital, Medical, and Infectious Waste Incinerators on March 7, 2012.

Stericycle has determined that the retrofits to the existing air pollution control system at the North Salt Lake facility are required in order to achieve compliance with the more stringent emission limitations. The retrofits will consist of replacement of a gas cooler with a new evaporative cooler, replace an electrostatic precipitator with a new more efficient baghouse, replace the current wet gas absorber with a new absorber, add a carbon bed downstream of the absorber and include urea or an equivalent reagent to be used in the existing SNCR system to reduce NO_x emissions. [Last updated April 8, 2014]

ACRONYMS

The following lists commonly used acronyms and associated translations as they apply to this document:

40 CFR	Title 40 of the Code of Federal Regulations
AO	Approval Order
BACT	Best Available Control Technology
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CDS	Classification Data System (used by EPA to classify sources by size/type)
CEM	Continuous emissions monitor
CEMS	Continuous emissions monitoring system
CFR	Code of Federal Regulations
CMS	Continuous monitoring system
CO	Carbon monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent - 40 CFR Part 98, Subpart A, Table A-1
COM	Continuous opacity monitor
DAQ	Division of Air Quality (typically interchangeable with UDAQ)
DAQE	This is a document tracking code for internal UDAQ use
EPA	Environmental Protection Agency
FDCP	Fugitive dust control plan
GHG	Greenhouse Gas(es) - 40 CFR 52.21 (b)(49)(i)
GWP	Global Warming Potential - 40 CFR Part 86.1818-12(a)
HAP or HAPs	Hazardous air pollutant(s)
ITA	Intent to Approve
LB/HR	Pounds per hour
MACT	Maximum Achievable Control Technology
MMBTU	Million British Thermal Units
NAA	Nonattainment Area
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standards for Hazardous Air Pollutants
NOI	Notice of Intent
NO_x	Oxides of nitrogen
NSPS	New Source Performance Standard
NSR	New Source Review
PM_{10}	Particulate matter less than 10 microns in size
$PM_{2.5}$	Particulate matter less than 2.5 microns in size
PSD	Prevention of Significant Deterioration
PTE	Potential to Emit
R307	Rules Series 307
R307-401	Rules Series 307 - Section 401
SO_2	Sulfur dioxide
Title IV	Title IV of the Clean Air Act
Title V	Title V of the Clean Air Act
TPY	Tons per year
UAC	Utah Administrative Code
UDAQ	Utah Division of Air Quality (typically interchangeable with DAQ)
VOC	Volatile organic compounds

R307-401-12. Reduction in Air Contaminants.

(1) Applicability. The owner or operator of a stationary source of air contaminants that reduces or eliminates air contaminants is exempt from the approval order requirements of R307-401-5 through 8 if:

(a) the project does not increase the potential to emit of any air contaminant or cause emissions of any new air contaminant, and

(b) the director is notified of the change and the reduction of air contaminants is made enforceable through an approval order in accordance with (2) below.

(2) Notification. The owner or operator shall submit a written description of the project to the director no later than 60 days after the changes are made. The director will update the source's approval order or issue a new approval order to include the project and to make the emission reductions enforceable. Public review under R307-401-7 is not required for the update to the approval order.

Stericycle®
Protecting People. Reducing Risk.™

November 6, 2013

Utah Department of Environmental Quality

Jon Black, Engineer
Utah Division of Air Quality
Major New Source Review Section
195 North 1950 West
Salt Lake City, UT 84114-4820

Subject: NSR Approval Order under and Administrative Action authorized by UDAQ regulation R307-401-12 "Reduction in Air Contaminants".

Dear Mr Black:

Stericycle, Inc. (Stericycle) owns and operates a commercial medical waste incineration facility located in North Salt Lake, Utah. Pursuant to our Title V Operating Permit Number 1100055002 condition II.B.4.c.1.A(c).

Stericycle is in a position to replace a diesel generator with a new model emergency diesel generator which will be a lower emission generating unit. In Table 1, Stericycle can demonstrate that the new emergency diesel generator emits less emissions than the old emergency generator and can be included in the current NSR Approval Order under and Administrative Action authorized by UDAQ regulation R307-401-12 "Reduction in Air Contaminants". This rule allows the Approval Order to be modified to include the replacement equipment as long as the new equipment does not emit air contaminants greater than the previously permitted piece of equipment. This permitting action is performed under the normal NSR permitting process through the submittal of a Notice of Intent document but does not require a 30-day comment period.

If you have any questions or require additional information, please contact me at 801.330.1758.

Stericycle, Inc.

Steven McOmber
Stericycle Regional Environmental Manager

cc: File

Table 1
Stericycle, Inc. - North Salt Lake, UT Facility
Emissions Summary

Pollutant	Current Emissions (ton/yr)			Future Emissions (ton/yr)			Total Emissions Change (ton/yr)
	Emergency Generator[a]	Bypass[b]	Total	Emergency Generator[a]	Bypass[c]	Total	
Criteria Pollutants							
NO_x	1.25	2.44E-03	1.25	1.17	1.79E-03	1.17	-0.08
CO	0.27	7.05E-05	0.27	0.66	5.16E-05	0.66	0.39
SO_x	0.08	1.49E-03	0.08	0.37	1.09E-03	0.37	0.29
PM/PM_{10}	0.09	3.20E-03	0.09	0.04	2.34E-03	0.04	-0.05
VOC	0.10	2.05E-04	0.10	8.06E-02	1.50E-04	0.08	-0.02
Lead	-	4.99E-05	4.99E-05	-	3.65E-05	3.65E-05	-1.34E-05
GHGs							
$CO_2e^{(g)}$	46.07	5.14	51.21	123.05	3.76	126.81	75.60
CO_2	45.92	5.13	51.05	122.64	3.76	126.39	75.34
CH_4	1.86E-03	2.05E-04	2.07E-03	4.97E-03	1.50E-04	5.12E-03	3.06E-03
N_2O	3.73E-04	-	3.73E-04	9.95E-04	-	9.95E-04	6.22E-04
HAPs							
Benzene	2.63E-04	-	2.63E-04	5.84E-04	-	5.84E-04	3.21E-04
Toluene	1.15E-04	-	1.15E-04	2.11E-04	-	2.11E-04	9.62E-05
Xylenes	8.03E-05	-	8.03E-05	1.45E-04	-	1.45E-04	6.49E-05
1,3-Butadiene	1.10E-05	-	1.10E-05	-	-	-	-1.10E-05
Formaldehyde	3.32E-04	-	3.32E-04	5.93E-05	-	5.93E-05	-2.73E-04
Acetaldehyde	2.16E-04	-	2.16E-04	1.90E-05	-	1.90E-05	-1.97E-04
Acrolein	2.60E-05	-	2.60E-05	5.93E-06	-	5.93E-06	-2.01E-05
Naphthalene	2.39E-05	-	2.39E-05	9.78E-05	-	9.78E-05	7.39E-05
Hydrogen Chloride	-	2.30E-02	2.30E-02	-	1.68E-02	1.68E-02	-6.16E-03
Hydrogen Fluoride	-	1.02E-04	1.02E-04	-	7.48E-05	7.48E-05	-2.74E-05
Cadmium	-	3.76E-06	3.76E-06	-	2.75E-06	2.75E-06	-1.01E-06
Mercury	-	7.33E-05	7.33E-05	-	5.37E-05	5.37E-05	-1.97E-05
Dioxins/Furans	-	4.21E-10	4.21E-10	-	3.08E-10	3.08E-10	-1.13E-10

[a] Emissions reflect a maximum of 300 hours of operation per year.

[b] Emissions represent actual bypass emissions from a representative calendar year.

[c] Emissions reflect a reduction in bypass time caused by power supply interruption as a result of replacing the emergency generator.

Letter Health Consultation

Modeled Air Exposures from the Stericycle Medical Waste Incinerator Emissions

North Salt Lake
Davis County, Utah

December 12, 2013

Prepared under a Cooperative Agreement with the
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Agency for Toxic Substances and Disease Registry
Division of Community Health Investigations
Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members.

You may contact the Environmental Epidemiology Program, Utah Department of Health at
801-538-6191
or
Visit our Home Page at: http://health.utah.gov/enviroepi/

LETTER HEALTH CONSULTATION

MODELED AIR EXPOSURES FROM THE STERICYCLE MEDICAL WASTE INCINERATOR EMISSIONS

NORTH SALT LAKE
DAVIS COUNTY, UTAH

Prepared By:

Environmental Epidemiology Program
Bureau of Epidemiology
Utah Department of Health
Under a Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

To: Dr. Robert Rolfs
Deputy Director
Utah Department of Health
288 N. 1460 W.
Salt Lake City, UT 84116

Subject: Modeled air exposures from the Stericycle medical waste incinerator emissions

Dear Dr. Rolfs,

Recently, citizens of North Salt Lake and the Utah Governor's office have expressed concerns regarding the potential for human health impacts due to pollutant emissions from the Stericycle medical waste incinerator. The Environmental Epidemiology Program (EEP) of the Utah Department of Health, in conjunction with the Utah Division of Air Quality, has conducted this analytical review of the potential emissions and stack data from the incinerator. This report uses AERMOD air dispersion modeling analyses to identify the maximum predicted residential pollutant concentrations. This letter health consultation provides a summary of the EEP's evaluation of two questions: 1) Are current emissions limits for the Stericycle incinerator protective of the health of area residents? and 2) Did Stericycle's violation of emissions limits expose area residents to unsafe levels of pollutants?

Background

Stericycle, Inc. is a large national provider of regulated waste disposal services. Founded in 1989, the company is headquartered in Lake Forest, Illinois. In November 1999, Stericycle acquired BFI Medical Waste, Inc., and with it a medical waste incinerator located at 90 North 1100 West in North Salt Lake, Davis County, UT (DSHW, 2005. See **Map 1**). This facility accepts medical waste from a variety of markets throughout North America, primarily the Pacific coast and Intermountain states (DSHW, 2005). The permitted capacity for the incinerator is 1,850 pounds of waste per hour (DSHW, 2006). In the 2011 calendar year, Stericycle received 7,223 tons of medical waste for incineration at the North Salt Lake facility, 84% of which originated outside of Utah (DSHW, 2011).

The types of waste the Stericycle facility is permitted to accept include (DSHW, 2006):

- Non-hazardous medical waste, including laboratory waste, glassware, and sharps
- Surgical specimens and tissues, animal tissues and carcasses, blood, and body fluids
- Infectious wastes from veterinaries, mortuaries, research, and industry
- Expired and unused pharmaceuticals and contraband
- Outdated consumer commodities, proprietary packaging, and records
- Recalled medical equipment and supplies
- Agriculture waste, and municipal solid waste contaminated with infectious waste
- Other non-hazardous waste approved by the Director that is appropriate for a medical waste incinerator

Prior to 2001, the area north of the Stericycle incinerator was zoned for industrial and manufacturing purposes and was largely undeveloped. However, the city of North Salt Lake

rezoned this area for mixed purpose use, and development began on a residential subdivision in 2003 (KUER, 2013). Currently, residential properties border the incinerator to the north and extend in that direction for approximately two miles. Properties east and south of the facility are primarily a mix of industrial and undeveloped properties, and the land west is largely undeveloped.

Incineration of medical waste produces a number of potentially hazardous pollutants, and Stericycle is required to comply with all relevant Federal and State emissions regulations as outlined in their Title V operating permit issued by the Utah Division of Air Quality (DAQ), Department of Environmental Quality (DEQ). Currently, Stericycle is required to monitor the emission levels of nine pollutants: cadmium, carbon monoxide (CO), dioxins/furans, hydrogen chloride gas (HCl), lead, mercury, nitrogen oxides (NO_x), particulate matter (PM), and sulfur dioxide (SO_2) (DEQ, 2009). Testing of emissions at the stack (a 'stack test') is mandated every three years for PM, CO, and HCl, and every five years for dioxins/furans, SO_2, NO_x, lead, cadmium, and mercury. These stack tests must use conditions representative of normal operating procedures. If a test indicates emissions of a pollutant are exceeding permitted levels, annual testing for that pollutant is required until levels are in compliance for a three year period (DEQ, 2009).

On May 28, 2013, DAQ issued a Notice of Violation and Order to Comply to Stericycle for multiple violations of the pollutant emissions limits specified in its operating permit (DAQ, 2013a). On August 28, 2013, DAQ issued an amended Notice of Violation to explicitly cover each day of emissions exceedance (DAQ, 2013b). The violations identified by DAQ occurred between 2011 and 2013 and include:

- Emissions exceeding the permit limits for dioxins/furans
- Emissions exceeding the permit limits for NO_x on multiple occasions
- Emissions exceeding the permit limits for HCl
- Failure to report the emissions exceedances to DAQ in the requisite time frame
- Failure to maintain normal operating conditions during the December 2011 stack test
- Failure to include the test results demonstrating these emission exceedances in the requisite annual and semi-annual monitoring reports

Table 1 lists the permitted emissions limits for the Stericycle incinerator, as well as the dates and levels of emissions exceedances.

In November 2013, the EPP requested that DAQ conduct air dispersion modeling analyses to identify the maximum predicted off-property annual air concentrations of pollutants released by the incinerator. These analyses were based upon predicted maximum emission outputs, actual stack data testing data, physical characteristics of the stack, emission temperature, emission velocity, and a five-year historical record of meteorology monitored near the site.

Results and Discussion

Air Dispersion Modeling Analyses

The DAQ air dispersion modeling analyses were based on the following design and inputs:

- AERMOD modeling system version 12060

- National Weather Service surface and upper air meteorology monitored at the Salt Lake City International Airport from 2006 through 2010
- Site: Stericycle medical waste incinerator, North Salt Lake, Utah: UTM Easting 420776, Northing 4521837, elevation 4,229 feet
- Area evaluated: Out to four kilometers (km) from the site location
- Unit emission rates with temperatures and flow rates based on February 2013 stack testing data

Maps 2 & 3 show the predicted isopleths of the annual concentration gradient from the air dispersion modeling analyses up to four km and two km from the Stericycle incinerator, respectively. In this situation, an isopleth is a line on a map connecting all points that have the same predicted average concentration of a pollutant. The gradient reflects the weather patterns known to occur in this area, where air flows are most often from either the north-northwest or south. Modeling indicated that the highest concentrations would occur at a point 110 meters north-northwest of the incinerator stack, designated by the innermost dark orange isopleth. Pollutant concentrations would continue to dilute further from the facility, denoted by isopleths progressing through orange to green to purple.

The highest predicted pollutant concentrations in the vicinity of the incinerator (i.e., in the innermost dark orange isopleth) are listed in **Table 2**. Except where noted, these concentrations are based on the maximum emissions limits listed in Stericycle's DAQ operating permit, meaning that these concentrations assume that the incinerator is releasing the maximum allowed amount of each pollutant. Typically, stack tests at the Stericycle incinerator have shown considerably lower levels of pollutant emissions. The predicted highest concentrations were also calculated for dioxins/furans, hydrogen chloride, and nitrogen oxides based on their emissions levels when Stericycle was in violation of their permit. In these cases, the analyses assume a constant release of the pollutants at their highest recorded levels.

Toxicological Evaluation

The EEP determines if a potential health risk exists by comparing environmental sampling or modeling results to comparison values (CVs) calculated by the Agency for Toxic Substances and Disease Registry (ATSDR) or the U.S. Environmental Protection Agency (EPA). A CV is a concentration of a substance in air, water, food, or soil that is unlikely to cause harmful health effects in exposed people. It should be stressed, however, that comparison values are screening tools, not thresholds of toxicity. While levels at or below a CV may reasonably be considered safe, it does not necessarily follow that concentrations above a CV would be expected to cause harmful health effects. Rather, levels above a CV indicate the need for further evaluation.

A list of relevant CVs for each pollutant is listed in **Table 2**, and includes cancer risk evaluation guides (CREG), environmental media evaluation guides (EMEG), reference concentrations (RfC), and National Ambient Air Quality Standards (NAAQS). A complete definition for each CV is listed in **Appendix C: Acronyms and Definitions**. ATSDR has developed a hierarchy of CVs for use in screening human exposure data (ATSDR, 2005). In general, hierarchy 1 guidelines such as CREGs and chronic EMEGs are preferred, due in part to their conservative assumptions regarding exposure. If those are not available, hierarchy 2 guidelines such as intermediate EMEGs and RfCs are selected. If there are no CVs from the preceding hierarchy

levels, values from additional sources may be used (such as the NAAQS levels in this report). The EEP has chosen the most conservative (i.e., lowest) comparison value available for each pollutant. CV entries of 'NA' indicate that a comparison value for that chemical/CV type combination was not available or not applicable, most commonly because that particular chemical either a) cannot be adequately assessed for it toxicity via inhalation or b) has not been classified as a human carcinogen. As of the writing of this document, no comparison values exist for inhalation exposure to dioxins/furans.

Cadmium

Cadmium is an element found the earth's crust, typically found combined with other elements like oxygen, chlorine, or sulfur. All soils and rocks contain some cadmium. It has many industrial applications and can be found in batteries, pigments, metal coatings, and plastics. EPA, the U.S. Department of Health and Human Services (DHHS), and the International Agency for Research on Cancer have determined that cadmium and cadmium compounds are human carcinogens (ATSDR, 2012a). Based on air dispersion modeling, the highest residential concentration is predicted to be 0.0076 $\mu g/m^3$, which is higher than the CREG comparison value of 0.00056 $\mu g/m^3$ but lower than the non-cancer chronic EMEG of 0.01 $\mu g/m^3$. This predicted concentration is based on the assumption that the incinerator is constantly releasing the maximum permitted amount of cadmium at 0.16 mg/m^3 of exhaust gas. However, the highest concentration of cadmium actually recorded in the exhaust gas of the incinerator was 0.003 mg/m^3, which is over 50 times lower than the permitted limit. Using this value as the basis for estimation, which is more likely to accurately reflect real emission limits, results in a predicted highest residential cadmium concentration of 0.0001 $\mu g/m^3$, which is lower than both the CREG and chronic EMEG comparison values. Based on these data, the EEP would not expect harmful health effects from residential inhalation exposures to cadmium solely released from the incinerator.

Carbon Monoxide

Carbon monoxide is a colorless, odorless, tasteless, non-irritating gas found in both indoor and outdoor air. It is formed from the incomplete combustion of carbon-based fuels; automobile exhaust is the most significant human-made source (ATSDR, 2012b). The highest predicted residential concentration of CO is modeled at 2.21 $\mu g/m^3$, considerably lower than the best available CV of 10,000 $\mu g/m^3$ based on the NAAQS primary standard. The EEP would not expect harmful health effects from residential inhalation exposures to CO solely released from the incinerator.

Dioxins/furans

Dioxins and furans are a diverse class of many different yet related compounds. While they are not intentionally manufactured except in small amounts for research purposes, they can be formed during the chlorine bleaching process of pulp in paper mills, contaminants in the manufacture of some organic chemicals, or be released from municipal and industrial solid waste incinerators (ATSDR, 1995; ATSDR, 1999a). Dioxins/furans can also be found in cigarette smoke (ATSDR, 1998). Due to their variable toxicity, the concept of toxic equivalence (TEQ) for dioxins/furans was developed. TEQ expresses the toxicity of the various dioxins and furans in terms of the most toxic form, 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD). The World Health Organization and DHHS have determined that TCDD may reasonably be anticipated to cause

cancer (ATSDR, 1999a). The highest predicted concentration of dioxins/furans in the vicinity of the incinerator was modeled at 0.0003 $\mu g/m^3$, based on the maximum recorded emission during the permit violation. Based on the maximum permitted emission limits, the highest predicted concentration is modeled at 0.00006 $\mu g/m^3$. As of the writing of this document, there are no comparison values for exposure to dioxins/furans via inhalation. Therefore, the EEP cannot determine if harmful residential inhalation exposures could occur to dioxins/furans in the vicinity of the incinerator.

Hydrogen chloride

Hydrogen chloride is a colorless to slightly yellow, corrosive, non-flammable gas with a strong, irritating odor. Upon release, hydrogen chloride gas reacts quickly with water in the air and soil, neutralizing the gas and making the water more acidic (ATSDR, 2002a). The highest predicted residential concentration of HCl was modeled at 10.37 $\mu g/m^3$, based on the maximum recorded HCl emissions while the incinerator was in permit violation. The highest predicted residential concentration based on the emission limits allowed on Stericycle's operating permit is modeled at 7.25 $\mu g/m^3$. Both values are lower than the EPA RfC comparison value of 20 $\mu g/m^3$. Therefore, the EEP would not expect harmful health effects from residential inhalation exposures to HCl solely released from the incinerator.

Lead

Lead is a naturally occurring bluish-gray metal found in small quantities in the earth's crust. It is used in many different products, including batteries, ammunition, metal solder, and devices to shield x-rays. In the past, it was used in paints and as an additive in gasoline. Lead can be found in all parts of our environment, in part due to human activities such as mining, manufacturing, and burning fossil fuels (ATSDR, 2007). The best available CV for lead exposure via inhalation is based on the NAAQS three-month average primary standard of 0.15 $\mu g/m^3$. The highest predicted residential concentration of lead based on the emission limits allowed on Stericycle's operating permit is modeled at 0.057 $\mu g/m^3$, substantially lower than the CV. Therefore, the EEP would not expect harmful health effects from residential inhalation exposures to lead solely released from the incinerator.

Mercury

Mercury is a naturally occurring metallic element that has several forms. Elemental mercury is a shiny, silver-white, odorless liquid that becomes a colorless, odorless gas when sufficiently heated. Mercury also may combine with other elements, such as chlorine, oxygen, and sulfur, to form inorganic mercury salts, or with carbon to form organic mercury compounds. The most common organic compound, methylmercury, is produced mainly by microbes in the soil and water (ATSDR, 1999b). The highest predicted residential concentration of mercury based upon the emission limits allowed on the Stericycle operating permit is modeled at 0.026 $\mu g/m^3$, which is significantly lower than the chronic EMEG comparison value of 0.20 $\mu g/m^3$. Based on these data, the EEP would not expect harmful health effects via residential inhalation exposures to mercury solely released from the incinerator.

Nitrogen oxides

Nitrogen oxides are a mixture of gases composed of nitrogen and oxygen, the two most toxicologically significant of which are nitric oxide (NO) and nitrogen dioxide (NO_2). Both are

non-flammable and colorless to brown at room temperature. Reactions between nitrogen and oxygen containing compounds during combustion are a major source of NO_X, and it can be a significant source of air pollution in areas with high motor vehicle traffic. They also have industrial applications in the manufacture of nitric acid, lacquers, dyes, rocket fuels, and other chemicals. NO_X is broken down quickly in the environment to form nitric acid, ozone, and other compounds, primarily by reacting with things like sunlight and water (ATSDR, 2002). The highest predicted residential concentration of NO_X near the incinerator was 40.01 $\mu g/m^3$, calculated from the maximum recorded emissions while Stericycle was in permit violation. The highest residential concentration based on permitted emission limits is modeled at 22.83 $\mu g/m^3$. Both predicted values are lower than the best available CV of 99.73 $\mu g/m^3$, which is based on the NAAQS NO_2 annual primary standard. Based on these data, the EEP would not expect harmful health effects from residential inhalation exposures to nitrogen oxides solely released from the incinerator.

Particulate matter

Particulate matter is a complex mixture of extremely small particles and liquid droplets. It can consist of a number of components, including acids, organic chemicals, metals, and soil or dust particles. The size of the particles is linked to their potential for causing health problems. Particles that are 10 micrometers in diameter or smaller (PM_{10}) can pass through the nose and throat and enter the deepest parts of the lungs (EPA, 2003). The highest predicted residential concentration of PM near the Stericycle incinerator is modeled at 1.64 $\mu g/m^3$, based upon the maximum permitted emissions limits. This concentration is much lower than the best available CV of 150 $\mu g/m^3$, based on the NAAQS PM_{10} annual primary standard. Therefore, the EEP would not expect harmful health effects from residential inhalation exposures to particulate matter solely released from the incinerator.

Sulfur dioxide

Sulfur dioxide is a colorless gas with a pungent odor that dissolves easily in water. SO_2 found in the air is mainly due to human activities such as the burning of coal and oil in power plants and copper smelting. It is also used in the manufacture of sulfuric acid and in the winemaking process (ATSDR, 1999c). The highest predicted concentration of SO_2 near the incinerator is modeled at 0.034 $\mu g/m^3$ based on the maximum permitted emissions limits. This concentration is significantly lower than the most conservative available CV of 26 $\mu g/m^3$. Therefore, the EEP would not expect harmful health effects from residential inhalation exposures to sulfur dioxide solely released from the incinerator.

Conclusions

Based on air dispersion modeling analyses, exposure via inhalation to emissions from the Stericycle medical waste incinerator is not expected to harm people's health. Air modeling predicted that the highest recorded levels of pollutants during the period of violation were not expected to harm residents' health.

With the exception of cadmium emission limits, the current emission limits in place are protective of residents' health based upon air dispersion modeling. It should be noted that actual

stack test data at the Stericycle incinerator indicates emission levels well below the permitted limits (**Table 1**).

The highest predicted concentration of cadmium based on the maximum permitted emissions limit was lower than the most conservative non-cancer CV, yet higher than the CREG. It must be stressed that this predicted concentration was not based on actual emissions data, and overestimates the actual cadmium emissions as indicated by stack testing data. The highest recorded level of cadmium emitted from the incinerator dating back to 2006 was 0.003 mg/m^3 (3 $\mu g/m^3$) during the January 25, 2013 stack test, a value 50 times lower than the emissions limit. Based on these data, the highest predicted concentration of cadmium resulting from a recorded emissions level is 0.00014 $\mu g/m^3$. This is lower than both comparison values and would not be expected to harm people's health (**Tables 1 & 2**).

Given that the current cadmium emissions limit for the Stericycle incinerator is 0.16 mg/m^3, the potential exists for the facility to release cadmium at a level that exceeds the cancer-based CV yet remain in compliance with their operating permit. Lowering the cadmium emissions limit to approximately 0.0117 mg/m^3 would keep the maximum allowable release of cadmium at or below the CREG (the most conservative CV).

During portions of the time period between December 2011 and April 2013, UDAQ found that the Stericycle incinerator exceeded their maximum permitted emission limits for NO_X, HCl, and dioxins/furans.

Modeled residential exposures to incinerator emissions predicted concentration of HCl and NO_X below the health-based CVs for these contaminants (**Table 2**), therefore the EEP finds that during these periods of violation these contaminants would not have been expected to harm people's health.

As there are no comparison values currently available for inhalation of dioxins/furans, the EEP has no basis to make an assessment of the potential health impact for this exposure pathway. Therefore, the EEP cannot determine if harmful residential inhalation exposures to dioxins/furans could occur in the vicinity of the incinerator.

In summary,

- With the exceptions of cadmium and dioxins/furans as discussed above, the EEP concludes that the current emissions limits for the Stericycle medical waste incinerator are protective of the health of area residents.
- The EEP cannot determine the potential for adverse health effects due to air exposures to dioxins/furans due to the lack of conclusive toxicological data needed to generate a health-based CV.
- Actual cadmium emissions from the incinerator are not expected to harm people's health.
- Stericycle's violation of the emission limits for HCl and NO_X are not expected to harm resident's health.

Recommendations

- Although stack testing at the Stericycle facility indicates that cadmium emissions are not expected to harm people's health, the current emissions limits for cadmium at this facility are not protective of residents' health. Therefore, the EEP recommends that UDAQ and Stericycle amend the permitted cadmium emissions limits from 0.16 mg/m^3 to 0.0117 mg/m^3.

- As dioxin/furans are a probable carcinogen, and it is known that oral exposure to low levels of dioxins/furans from contaminated soil and food grown in contaminated soils represents the major route of environmental exposure for the general population (ATSDR, 1998), the EEP finds that soil sampling of the residential and non-residential areas surrounding the Stericycle incinerator are warranted.

Although modeled residential exposures to predicted and actual heavy metal emissions were below health-based CVs, the persistence of these contaminants in soils, coupled with community concerns, warrants further investigative soil sampling. The EEP recommends that the residential soils be sampled for the eight heavy metals regulated by the federal Resource Conservation and Recovery Act (RCRA) (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver). The results of these soil samplings will be released in a separate assessment document along with the results of the dioxin/furan soil sampling.

Sincerely,

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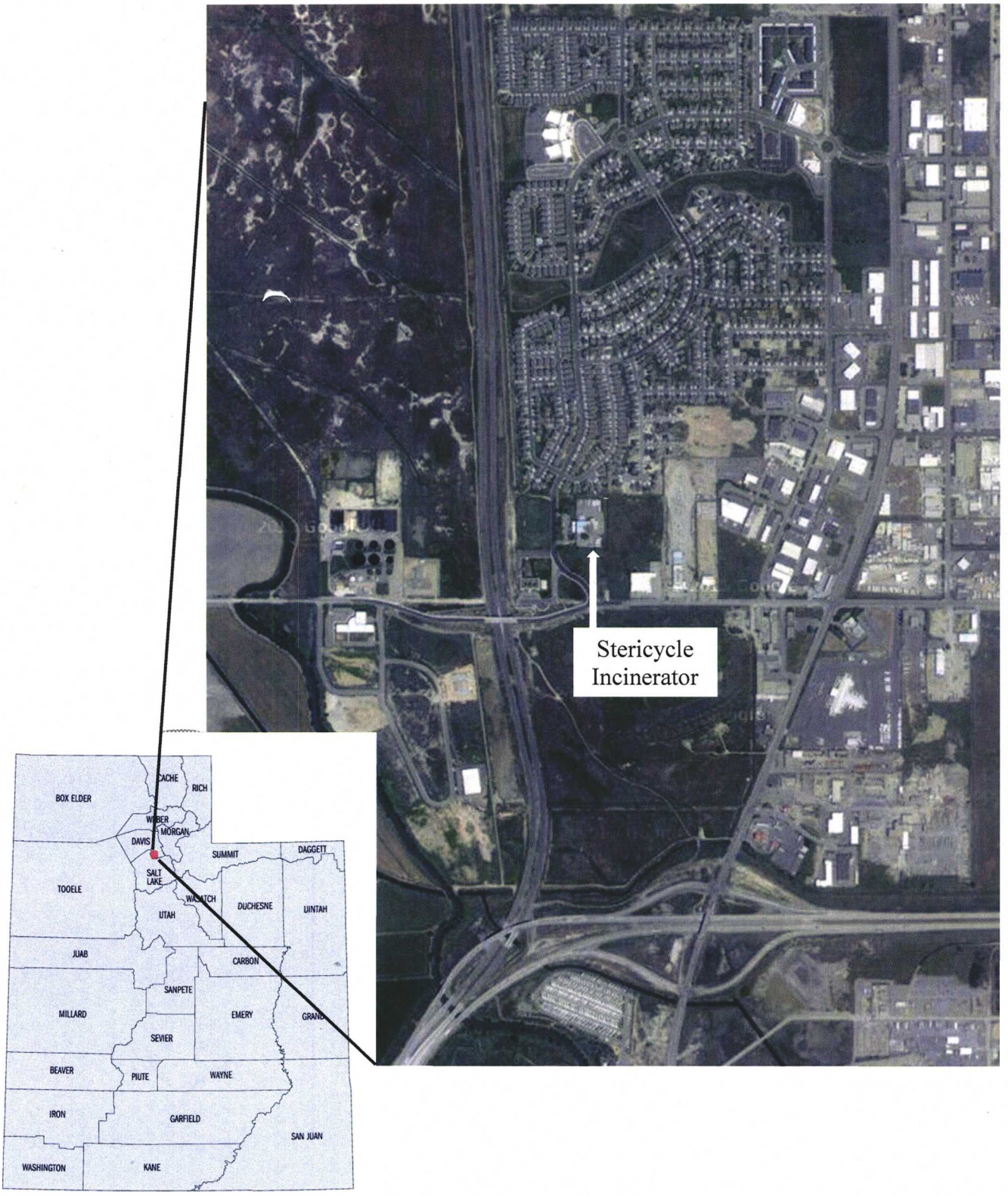
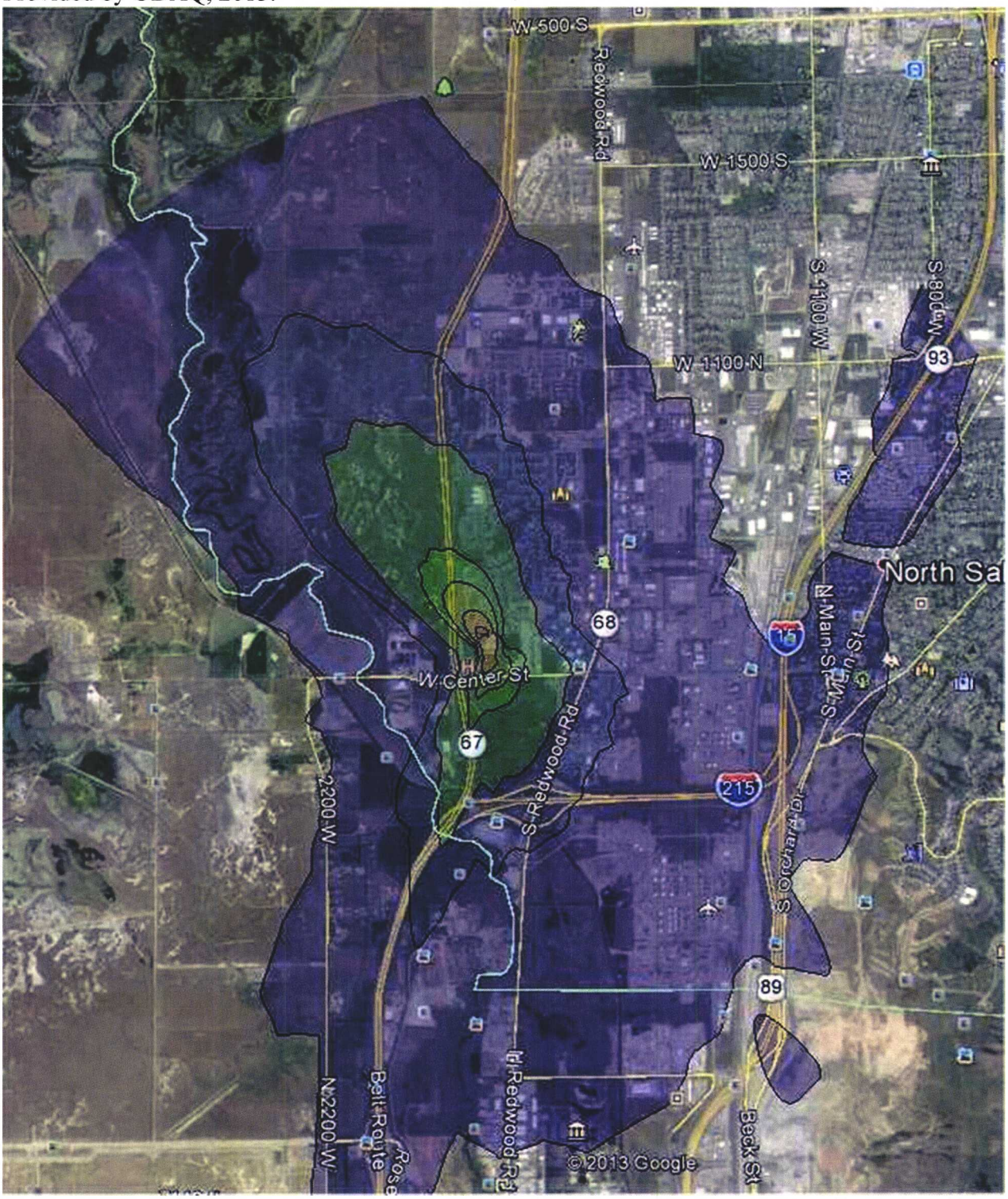
Appendix A

Maps

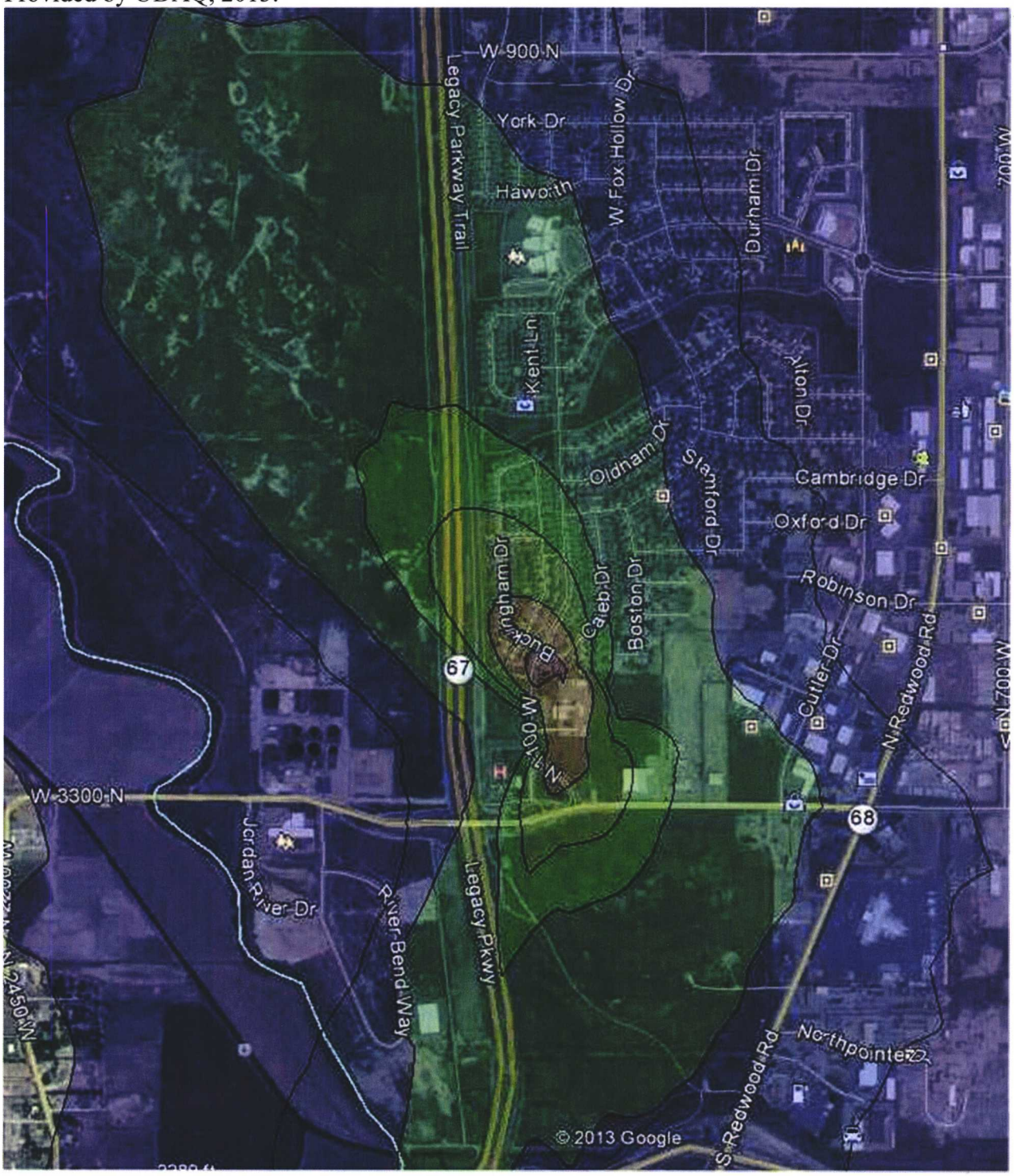
Map 1: Location of the Stericycle hospital/medical/infectious waste incinerator.



Map 2: Pollutant concentration gradient out to four kilometers from the Stericycle incinerator. Provided by UDAQ, 2013.



Map 3: Pollutant concentration gradient out to two kilometers from the Stericycle incinerator. Provided by UDAQ, 2013.



Appendix B

Tables

Table 1. Emissions limits, stack test dates, and test results for the Stericycle incinerator.

Pollutant	Test Frequency (years) [a]	Test Date	Result	Limit
Cadmium (mg/dscm)	5	10/18/2006	0.001	0.16
		12/28/2011	0.001	0.16
		1/25/2013	0.003	0.16
Carbon Monoxide (ppmdv)	3	11/11/2009	20	40
		11/8/2012	2	40
		1/25/2013	5	40
		4/10/2013	3	40
Dioxins/Furans (ng/dscm)	5	10/18/2006	2	125
		12/28/2011	**616.4**	**125**
		2/15/2012	2	125
		1/25/2013	0	125
Dioxins/Furans (TEQ) (ng/dscm)	5	10/18/2006	0.1	2.3
		12/28/2011	**11.7**	**2.3**
		2/15/2012	0.1	2.3
		1/25/2013	0.3	2.3
Hydrogen Chloride (ppmdv)	3	11/11/2009	6	100
		11/8/2012	0.03	100
		1/25/2013	**143.4**	**100**
		4/10/2013	5	100
Lead (mg/dscm)	5	10/18/2006	0.004	1.2
		12/28/2011	0.001	1.2
		1/25/2013	0.02	1.2
Mercury (mg/dscm)	5	10/18/2006	0.004	0.55
		12/28/2011	0.04	0.55
		1/25/2013	0.005	0.55
Nitrogen Oxides (ppmdv)	5	10/18/2006	250	250
		12/28/2011	**336**	**250**
		9/13/2012	**438**	**250**
		1/25/2013	122	250
		4/10/2013	177	250
Particulate Matter (mg/dscm)	3	11/11/2009	2	34
		11/8/2012	25	34
		1/25/2013	20	34
Sulfur Dioxide (ppmdv)	5	10/18/2006	6	55
		12/28/2011	1	55
		1/25/2013	10	55

[a] Required test frequency in the absence of an emissions violation.
dscm: dry standard cubic meter (m^3).
ppmdv: parts per million dry volume.

Table 2. Predicted highest annual residential pollutant concentrations at the Stericycle incinerator and relevant comparison values (CVs).

Pollutant	Highest Predicted Concentration ($\mu g/m^3$) [a]	CREG ($\mu g/m^3$)	Non-Cancer CV ($\mu g/m^3$)	CV Source
Cadmium	0.0076	0.00056	0.01	ATSDR Chronic EMEG
Cadmium [b]	0.00014	0.00056	0.01	ATSDR Chronic EMEG
Carbon Monoxide	2.21	NA	10,000	NAAQS 8-Hour Primary Standard
Dioxins/Furans	0.00006	NA	NA	NA
Dioxins/Furans Violation [c]	0.0003	NA	NA	NA
Dioxins/Furans TEQ	0.000001	NA	NA	NA
Hydrogen Chloride	7.25	NA	20	EPA RfC
Hydrogen Chloride Violation [d]	10.37	NA	20	EPA RfC
Lead	0.057	NA	0.15	NAAQS 3 Month Avg. Primary Standard
Mercury	0.026	NA	0.2	ATSDR Chronic EMEG
Nitrogen Oxides	22.83	NA	99.73	NAAQS NO_2 Annual Primary Standard
Nitrogen Oxides Violation [e]	40.01	NA	99.73	NAAQS NO_2 Annual Primary Standard
Particulate Matter	1.64	NA	150	NAAQS PM_{10} 24-Hour Primary Standard
Sulfur Dioxide	0.034	NA	26	ATSDR Acute EMEG

[a] Based on the maximum emissions limit listed in the DAQ operating permit, except where noted.

[b] Based on the highest measured emissions level of 0.003 mg/m^3.

[c] Average dioxins/furans concentration assumes daily exposure at 616.4 ng/m^3.

[d] Average hydrogen chloride concentration assumes daily exposure at 143.4 ppmdv.

[e] Average nitrogen oxide concentration assumes daily exposure at 438 ppmdv.

NA: Not available.

µg: micrograms.

m^3: cubic meter.

Appendix C

Acronyms and Definitions

ATSDR Agency for Toxic Substances and Disease Registry.

CO Carbon monoxide.

CREG Cancer risk evaluation guide. An estimate of the concentration of a contaminant that would be expected to cause no more than one excess case of cancer in a million persons exposed every day, 24 hours a day, for their lifetimes.

CV Comparison value. A concentration calculated by ATSDR or EPA of a substance in air, water, food, or soil that is unlikely to cause harmful health effects in exposed people.

DHHS United States Department of Health and Human Services

dscm Dry standard cubic meter of gas.

DSHW Division of Solid and Hazardous Waste, within the Utah Department of Environmental Quality.

DAQ Division of Air Quality, within the Utah Department of Environmental Quality.

DEQ Utah Department of Environmental Quality.

EEP Environmental Epidemiology Program, within the Utah Department of Health.

EMEG Environmental media evaluation guide. Concentrations of substances in water, soil, and air to which humans may be exposed during a specified period of time (acute, intermediate, or chronic) without experiencing adverse non-cancer health effects. Acute is 14 days or less, intermediate is 15 days to one year, and chronic is over one year.

EPA United States Environmental Protection Agency.

HCl Hydrogen chloride gas.

Isopleth A line on a map connecting all points that have the same value of some measureable quantity. In this report, the lines connect all points having the same predicted concentration of pollutant.

km Kilometers.

m^3 Cubic meter.

mg Milligrams. One thousandth of a gram.

NAAQS National Ambient Air Quality Standards.

NAAQS Primary Standard	An ambient air quality standard that provides public health protection, including the health of at-risk populations (e.g., asthmatics, children, and the elderly).
ng	Nanograms. One billionth of a gram.
NO_X	Nitrogen oxides. A mixture of gases composed of nitrogen and oxygen, the most toxicologically significant of which are nitric oxide (NO) and nitrogen dioxide (NO_2).
PM	Particulate matter.
PM_{10}	Particulate matter with a diameter of 10 micrometers or less.
ppmdv	Parts per million by dry volume.
RCRA	Resource Conservation and Recovery Act. Originally enacted in 1976, it is the principle federal law governing the disposal of solid and hazardous waste.
RfC	Reference concentration. An EPA estimate of the continuous inhalation exposure that is likely to be without an appreciable risk of adverse effects during a lifetime.
SO_2	Sulfur dioxide.
TCDD	2,3,7,8-tetrachlorodibenzo-*p*-dioxin. The most toxic type of dioxin/furan.
TEQ	Toxic equivalency for dioxins/furans. Expresses the toxicity of the various dioxins and furans in terms of the most toxic type, TCDD.
µg	Micrograms. One millionth of a gram.

Jon Black <jlblack@utah.gov>

Stericycle Meeting

1 message

Lindsey W. Kroos <lkroos@all4inc.com> Tue, Jun 10, 2014 at 10:48 AM
To: Jon Black <jlblack@utah.gov>
Cc: "Hoboy, Selin" <SHoboy@stericycle.com>, "Nold, Jim" <JNold@stericycle.com>

Hi Jon – thanks again for arranging tomorrow's meeting. As discussed, the following number can be used to connect me, Bill Straub, and Eric Swisher to the meeting:

610.933.5246 x112

If for some reason you are unable connect, please try my cell phone at 215.353.7834.

We look forward to meeting with you and your team tomorrow (6/11) at 9:30 am MT.

Should you have any questions in the meantime please don't hesitate to contact me – thank you!

Lindsey

Lindsey W. Kroos
Project Manager

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Jon Black <jlblack@utah.gov>

Stericycle AO Discussion: 1-800-531-3250 (Conf ID: 610933524612)

1 message

William Straub <wstraub@all4inc.com> Thu, May 29, 2014 at 4:22 AM
To: "jlblack@utah.gov" <jlblack@utah.gov>, "Stericycle_Jim Nold (JNold@stericycle.com)" <JNold@stericycle.com>

Thanks Jon and Jim – we will talk today at 4 pm ET (2 pm MT)

Call in Number: 1.800.531.3250
Conference Code: 610933524612
Moderator: William Straub

invite.ics
2K